PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 71
1958

WASHINGTON
PRINTED FOR THE SOCIETY

COMMITTEE ON PUBLICATIONS

HERBERT FRIEDMANN, *Chairman*

C. O. HANDLEY, JR. L. M. RUSSELL

PUBLICATION NOTE

By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

All correspondence should be addressed to the Biological Society of Washington, % U. S. National Museum, Washington, D. C.

MONUMENTAL PRINTING CO.
BALTIMORE, MD.

OFFICERS AND COUNCIL

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON
(FOR 1958-1959)

(ELECTED MAY 13, 1958)

OFFICERS

President
HOWARD B. OWENS

Vice-Presidents
(In the order of election)

DAVID H. JOHNSON
A. C. SMITH
C. F. W. MUESEBECK
ALLEN J. DUVALL

Recording Secretary
S. F. BLAKE

Corresponding Secretary
JOHN L. PARADISO

Treasurer
B. R. FEINSTEIN

Custodian of Publications
DAVID H. JOHNSON

COUNCIL

Elected Members

M. K. BRADY
V. S. SCHANTZ
L. M. RUSSELL
C. O. HANDLEY, JR.
HENRY W. SETZER

Ex-Presidents

J. W. ALDRICH
PAUL BARTSCH
W. A. DAYTON
H. G. DEIGNAN
HERBERT FRIEDMANN
A. D. HOPKINS
H. H. T. JACKSON
F. C. LINCOLN
H. C. OBERHOLSER
HUGH T. O'NEIL
J. S. WADE
E. P. WALKER
A. WETMORE

STANDING COMMITTEES—1958-1959

Committee on Communications

H. A. BORTHWICK
J. FRANCIS ALLEN
JOHN H. FALES

Committee on Zoological Nomenclature
A. WETMORE, *Chairman*

H. A. REHDER
C. F. W. MUESEBECK

Committee on Publications
HERBERT FRIEDMANN, *Chairman*

CHARLES O. HANDLEY, JR.
L. M. RUSSELL

EX-PRESIDENTS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

*Theodore N. Gill, 1881, 1882
*Charles A. White, 1883, 1884
*G. Brown Goode, 1885, 1886
*William H. Dahl, 1887, 1888
*Lester F. Ward, 1889, 1890
*C. Hart Merriam, 1891, 1892
*C. V. Riley, 1893, 1894
*Geo. M. Sternberg, 1895, 1896
*L. O. Howard, 1897, 1898
*Frederick V. Coville, 1899, 1900
*F. A. Lucas, 1901, 1902
*B. W. Evermann, 1903, 1904
*F. H. Knowlton, 1905, 1906
*L. Stejneger, 1907, 1908
*T. S. Palmer, 1909, 1910
*David White, 1911
*E. W. Nelson, 1912, 1913
Paul Bartsch, 1914, 1915
*W. P. Hay, 1916, 1917
*J. N. Rose, 1918
*Hugh M. Smith, 1919
A. D. Hopkins, 1920
*N. Holister, 1921
*Vernon Bailey, 1922
*A. S. Hitchcock, 1923
*J. W. Gidley, 1924
*S. A. Rowhrer, 1925
H. C. Oberholser, 1926-1927
*E. A. Goldman, 1927-1929
Alexander Wetmore, 1929-1931
H. H. T. Jackson, 1931-1933
*C. E. Chambliss, 1933-1936
*H. C. Fuller, 1936-1938
*W. B. Bell, 1938-1940
E. P. Walker, 1940-1942
*H. B. Humphrey, 1942-1944
*F. Thone, 1944-1946
J. S. Wade, 1946-1947
J. W. Aldrich, 1947-1949
F. C. Lincoln, 1949-1951
W. A. Dayton, 1951-1953
H. G. Deignan, 1953-1955
Hugh T. O'Neil, 1955-1956
Herbert Friedmann, 1957-1958

---

* Deceased.

TABLE OF CONTENTS

Volume 71

Officers and Committees for 1958
Proceedings for 1958
Additional subspecies of birds from Colombia, by Alexander Wetmore 1–4
Descriptions of some conifer feeding aphids from New England, by F. C. Hottes 5–10
A new gray-crowned rosy finch from northern Alaska, by Bernard Feinstein 11–12
Technical names of the South American marsh deer and pampas deer, by Philip Hershkovitz 13–16
The taxonomic status of Peromyscus allex Osgood, by Robert L. Packard 17–20
Miscellaneous prey records of solitary wasps. III (Hymenoptera, Aculeata), by Karl V. Krombein 21-26
A new gecko of the *Sphaerodactylus decoratus* group from Cuba, by Albert Schwartz 27–36
Another new large *Eleutherodactylus* (Amphibia: Leptodactylidae) from western Cuba, by Albert Schwartz........ 37–42
Aphthargelia nom. nov. for *Thargelia* Oestlund (Aphidae), by F. C. Hottes 43–44
North American Harpacticoid Copepods 4. Diagnoses of new species of fresh-water Canthocamptidae and Cletodidae (genus *Huntemannia*), by Mildred Stratton Wilson 43-48
North American Harpacicoid Copepods 5. The status of *Attheyella americana* (Herrick) and the correct name for the subgenus *Brehmiella*, by Mildred Stratton Wilson 49–52
Type localities and nomenclature of some American primates, with remarks on secondary homonyms, by Philip Hershkovitz 53–56
Five new South American Chilopods, by Ralph V. Chamberlin 57–60
A new species of *Cinara* (Aphidae) from Sitka spruce, by F. C. Hottes 61–62
A new Canadian species of *Cinara* (Aphidae) from *Picea rubens*, by F. C. Hottes 63–64
The status of the gray-breasted least honey-guides, by Herbert Friedmann 65–68
Six new species of Chinaia from Central America (Homoptera: Cicadellidae), by James P. Kramer 69–74
Two new Aphids from *Pinus contorta*, by F. C. Hottes........ 75–80
A new species of *Cinara* from Michigan (Aphidae), by F. C. Hottes 81–84
A new species of *Cinara* from Idaho (Aphidae), by F. C. Hottes 85–86

A new species of *Cinara* from Washington (Aphidae), by F. C. Hottes 87–90
Notes on the Scaphopod mollusks: rectifications of nomenclature II, by William K. Emerson 91–94
A revision of the Philippine Elegant Titmouse (Parus elegans), by Kenneth C. Parkes 95–106
The type locality and nomenclaturial status of Peromyscus maniculatus nebrascensis (Coues), by J. Knox Jones, Jr. 107–112
On the identity of *Pseudotremia cavernarum* Cope, a poorly known American Chordeumoid diplopod, by Richard L. Hoffman 113–118
Descriptions of two new Venezuelan birds and distributional notes, by William H. Phelps and William H. Phelps, Jr. 119–124
A new shrimp of the genus Periclimenes from the West Indies, by Fenner A. Chace, Jr. 125–132
New neotropical Veliidae (Hempitera), by Carl J. Drake........ 133–142
On the occurrence of Agrothrips in Illinois and Kansas, with a review of the North American species, by Lewis J. Stannard, Jr. 143–148
A new Coleonyx from Texas, by William B. Davis and James R. Dixon 149–152
A new Ampelocera from Cuba, by C. V. Morton........ 153–154
A new species of Essigella from Oregon (Aphidae), by F. C. Hottes 155–156
A new species of *Cinara* from California sugar pine (Aphidae), by F. C. Hottes 157–160
Two new birds from eastern Asia, by H. G. Deignan........ 161–162
Review of Mexican bats of the Artibeus "Cinereus" complex, by William B. Davis 163–166
The Status of the bat *Myotis velifer cobanensis* Goodwin, by Luis de la Torre 167–170
A new species of Cinara (Aphidae) from North Dakota, by F. C. Hottes 171–172
Pill millipeds (Desmonidae, Polydesmida) in the United States, by Nell B. Causey 173–178
New records and descriptions of a new genus and a new species of millipeds of the family Striariidae (Chordeumida), by Nell B. Causey 179–184
Occurrence of the Chilopod genus Ethmostigmus in America, by Ralph V. Chamberlin 185–186
A new species of Cinara from Delaware (Aphidae), by F. C. Hottes 187–190
Descriptions of two allied species of Cinara (Aphidae), by F. C. Hottes 191–196
A supplementary list of species and records of distribution for North American freshwater Ostracoda, by Edward Ferguson, Jr. 197–202

LIST OF PLATES

1. New Species of *Cinara* 6
2. *Sphaerodactylus decoratus drapetiscus,* n. sp. 30
3. *Eleutherodactylus zeus,* n. sp. 38
4. *Cinara sitchensis,* n. sp. 62
5. *Cinara nepticula,* n. sp. 64
6. *Chinaia lepida,* n. sp. 70
7. New Species of *Chinaia* 72
8. New Species of *Cinara* 77
9. *Cinara kocheta,* n. sp. 82
10. *Cinara kuchea,* n. sp. 86
11. *Cinara hirticula,* n. sp. 88
12. *Pseudotremia cavernarum* Cope 115
13. *Periclimenes* (*Periclimenes*) *pedersoni,* n. sp. 129
14. *Periclimenes* (*Periclimenes*) *pedersoni,* n. sp. 130
15. *Rhagovelia traili* (Buchanan-White) 134
16. *Husseyella halophila,* n. sp. 135
17. *Husseyella halovelia,* n. sp. 136
18. *Rhagovelia thaumana,* n. sp., & *R. vacuivana,* n. sp. 137
19. *Rhagovelia sabrina,* n. sp., & *R. stibea,* n. sp. 139
20. *Rhagovelia janeira* Drake & *R. hambletoni* Drake & Harris 140
21. *Agrothrips tantillus,* n. sp. 148
22. *Celoonyx reticulatus,* n. sp., & *Coleonyx elegans* 150
23. *Essigella oregonensis,* n. sp. 156
24. *Cinara saccharinipini,* n. sp. 159
25. Cranial profiles of five forms of Mexican *Artibeus* 164
26. Variation in position of teeth of *Myotis velifer velifer* from Michoacán, México and from Chocoyos, Guatemala 168
27. Guatemalan locality records of *Myotis velifer velifer,* and the type locality of *M. v. cobanensis* 169
28. *Cinara jucunda,* n. sp. 172
29. *Desmonus pudicus, D. inordinatus,* n. sp., and *D. austrus,* n. sp. 177
30. *Ethmostigmus californicus,* n. sp. 186
31. *Cinara tunicula,* n. sp. 189
32. *Cinara pinivora* (Wilson) and *Cinara harmonia,* n. sp. 195

Errata Slip

This is to call attention of librarians and others intending to bind this volume eventually that inadvertently page numbers 43 and 44 have been duplicated, as well as paper No. 9 for two papers, as follows:

paper No. 9, pp. 43-44, by F. C. Hottes, issued April 11, 1958
paper No. 9, pp. 43-48, by M. S. Wilson, issued May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS

The two meetings during 1958 were held in Room 43 of the United States National Museum.

1025th Meeting — May 13, 1958

SEVENTY-NINTH ANNUAL MEETING

President Friedmann in the chair; 20 persons present.

New members elected: R. E. Elbel, K. C. Emerson, J. P. Kramer, K. V. Krombein, Paul J. Kruse, R. J. Marsh, G. W. Mead, Richard Thomas, and George Zug.

The reports of the Corresponding Secretary and Treasurer were presented.

The following officers and Members of Council were elected: President: Howard B. Owens; Vice Presidents: David H. Johnson, A. C. Smith, Allen J. Duvall, C. F. W. Musebeck; Recording Secretary: S. F. Blake; Corresponding Secretary: J. L. Paradiso; Treasurer: B. R. Feinstein; Members of Council: M. K. Brady, C. O. Handley, Jr., L. M. Russell, V. S. Schantz, and Henry W. Setzer.

After the business meeting adjourned, President Friedmann gave a talk on wax digestion in the honey-guides.

1026th Meeting — December 4, 1958

President Owens in the chair; 22 persons present.

New members elected: F. H. Berry, D. K. Caldwell, J. R. Dixon, Edward Ferguson, Jr., K. I. Lange, R. H. Manville.

Formal communications: J. F. Gates Clarke, The Smithsonian-Bredin Caribbean Expeditions—1956 and 1958.

Vol. 71, pp. 1-4 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ADDITIONAL SUBSPECIES OF BIRDS FROM COLOMBIA

By Alexander Wetmore

The two races of Colombian birds described herewith have come to attention during study of the collections made in that country for the Smithsonian Institution by the writer and M. A. Carriker, Jr.

Family Rallidae

Laterallus albigularis cerdaleus subsp. nov.

Characters.—Similar to *Laterallus albigularis albigularis* (Lawrence),[1] but more reddish brown on the crown and sides of the head, and on the hindneck; deeper reddish brown on the upper breast; throat washed with reddish brown, so that the white prominent in this area in the typical race is much restricted or absent; black barring on posterior ventral surface continued evenly across the abdomen, producing a much blacker appearance.

Description.—Type, U.S. National Mus. no. 386782, male, from Mamatoco, 4 miles east of Santa Marta, Magdalena, Colombia, collected January 3, 1946, by M. A. Carriker, Jr. (original number 7374): Crown and hindneck Mars brown, washed with russet on the forehead; back, tertials, and wing coverts bister, the wing coverts tipped lightly with mikado brown; rump, upper tail coverts and longer secondaries blackish brown, washed with Vandyke brown; rectrices blackish brown internally, bordered prominently with Vandyke brown; outer secondaries and primaries Chaetura drab, edged lightly with drab; loral feathers hair brown basally, tipped with Mikado brown; feathers on lower eyelid drab; remainder of side of head between Mikado brown and Verona brown, changing to tawny on throat and foreneck, and to russet on sides of neck and across upper breast; feathers of chin and center of throat white basally, washed with tawny; rest of lower surface, including sides and under tail coverts, black, barred narrowly with white; shorter under wing coverts black, barred narrowly with white, longer ones broadly white, with restricted black markings. Distal third of maxilla fuscous; gonys dull honey yellow; remainder of bill black, with a wash of olive on the base of the mandibular rami; crus, tarsus and toes fuscous, becoming fuscous-black on the tarsal joint (from dried skin).

---

[1] *Corethrura albigularis* Lawrence, Ann. Lyc. Nat. Hist. New York, vol. 7, 1861, p. 302. (Atlantic side of the Isthmus of Panamá along the line of the Panama Railroad.)

Measurements.—Males (6 specimens), wing 67.6-74.3 (71.8), culmen from base 17.5-19.2 (18.6), tarsus 27.6-30.8 (29.3) mm.

Females (4 specimens), wing 69.0-77.8 (72.3), culmen from base 16.6-17.8 (17.0), tarus 27.3-30.4 (28.3) mm.

Type, male, wing 72.2, culmen from base 19.2, tarsus 30.8 mm.

Range.—The lower Magdalena Valley from eastern Bolívar (Norosí) and Atlántico (Laguna de Guájaro) eastward, and around the Sierra Nevada de Santa Marta (Hacienda La Esperanza on Río Cesar; Mamotoco, and La Concepción, east of Santa Marta).

Remarks.—Direct comparison of the form here described has been made with a series of 18 males and 17 females from the entire range of the typical subspecies in Panamá. The nominate race extends through Darién and western Colombia (6 males, 5 females examined from Chocó, Antioquia and Nariño) into western Ecuador (5 males, 4 females seen from Esmeraldas, Pambilar, San Javier and Manaví).

All of the specimens of *Laterallus melanophaius* that I have seen have the under tail coverts plain cinnamon brown, while in all of the long series of *albigularis* examined this area is barred black and white. Occasionally there is one that has a few of the under tail coverts tipped with brown, but this marking is casual in occurrence, being found at random through the entire range of *albigularis* (including the subspecies *caniceps*) north to Nicaragua. It can not therefore be considered an indication of integration. I can see no reason for uniting the *albigularis* group and the *melanophaius* complex in the same species.

Troglodytes aedon effutitus subsp. nov.

Characters.—Similar to *Troglodytes aedon atopus* Oberholser,[2] but paler above and below; dorsal surface in general more grayish brown, with the rump and upper tail coverts lighter brown, and the light bars on the rectrices less rufescent; throat and and foreneck averaging whiter; sides, flanks and under tail coverts brighter, being pinkish buff to clay color instead of sayal brown; under tail coverts usually less barred, in numerous specimens immaculate.

Description.—Type, U.S. National Museum no. 369759, male adult, from Maicao, Comisaría de la Guajira, Colombia, collected April 15, 1941, by A. Wetmore and M. A. Carriker, Jr. (original number 11414). Forehead drab, changing to pale hair brown toward center of crown, this continuing over pileum and hindneck; back and lesser wing coverts hair brown, washed with buffy brown; rump and upper tail coverts between sayal brown and snuff brown; tertials, outer webs of secondaries, and middle and greater wing coverts somewhat brighter than wood brown, barred narrowly with dusky neutral gray, the barring less definite on the wing coverts; inner webs of secondaries and both webs of primaries fuscous-black; outer webs of primaries marked with small, angular spots of light vinaceous-buff; lateral rectrices sayal brown, changing centrally to snuff brown, barred narrowly with dusky neutral gray; lores dull white; superciliary stripe pale pinkish buff, this color extending narrowly forward across upper margin of lores; feathers of auricular region tilleul buff edged with hair brown, producing a mottled appearance; central area of under surface from throat to abdomen white, with a faint wash of pale pinkish buff that is more pronounced across the breast; sides pinkish buff, changing to dull clay color on flanks and under tail coverts; central under tail coverts with two narrow bars of dusky neutral gray; edge of wing and under wing coverts dull white with a faint wash of pale pinkish buff. Maxilla and tip of mandible fuscous; base of mandible drab; tarsus hair brown; toes fuscous (from dried skin).

---

[2] *Troglodytes musculus atopus* Oberholser, Poc. U. S. Nat. Mus., vol. 25, January 23, 1904, p. 207. (Cacagualito, about 12 miles east of Santa Marta, Magdalena, Colombia.)

Measurements.—Males (11 specimens), wing 48.6-54.0 (51.1), tail 33.5-37.2 (35.4), culmen from base 15.4-17.8 (16.6), tarsus 17.5-18.7 (18.2) mm.

Females (7 specimens), wing 46.5-51.5 (48.8), tail 31.2-34.9 (33.5), culmen from base 14.4—16.3 (15.7), tarsus 16.8-18.6 (17.7) mm.

Type, male, wing 48.8, tail 33.7, culmen from base 16.0, tarsus 17.9 mm.

Range.—The Guajira Peninsula, and the middle and lower valley of the Río Ranchería in extreme northeastern Magdalena, Colombia; intergrading with *T. a. atopus* toward the eastern base of the Sierra Nevada de Santa Marta, and in the valley of the Río Cesar.

Remarks.—Todd[3] remarked 35 years ago on the apparent paler color of House Wrens from Riohacha on the Guajira boundary, but it is only with larger series, including birds from farther out in the Guajira, that the differences which establish this race have become evident. In April and early May, 1941 house wrens were common at Riohacha, particularly near the Río Ranchería. Farther west I found them near Maicao and also in the hills around Nazaret, where they ranged in the green forest along the base of the Serranía de Macuire, as well as in the drier areas. In the scrub growths near Puerto Estrella on the coast they were more common than in the interior. Fully grown immature birds have a stronger wash of brown on the under surface than adults. Males from the outer end of the peninsula are slightly larger than those from Maicao westward. Though I did not see house wrens at Puerto López it is probable that this race enters Venezuela around the base of the low hills of the Montes de Oca, southwest of Maicao.

Birds from the lower valley of the Río Ranchería are fairly typical, but there is intergradation with *Troglodytes aedon atopus* in the upper part of this drainage as well as in the low hills that lead back to the west toward the base of the Sierra Nevada. Two males from El Conejo, in the valley 10 miles east of Fonseca, are intermediates, while one from Tierra Nueva, at 4,000 feet elevation in the Sierra Negra, only a short distance to the southeast is definitely *atopus*, as is one from the little settlement of Distracción, 3 miles southwest of Fonseca. One from La Cueva, at 1800 feet in the eastern foothills of the Sierra Nevada, to the northwest of Fonseca on the old trail crossing to Riohacha, also is *atopus.*

The race *atopus* differs from *T. a. inquietus*, its neighbor to the west, by being brighter brown below, with the white of the lower surface restricted to the throat and abdomen, and grayer above, with the sides, flanks, and under tail coverts brighter brown. The maximum development of these markings, and of the barring on the under tail coverts, is found in the Department of Bolívar, there being a slight change toward lighter color through northern Magdalena. Though birds from the Santa Marta region thus show a hint of the paler garb of the new form here described, they are well within the boundaries of individual variation of the race *atopus,* which has its type locality in this area. The range of the subspecies extends across northern Colombia from the Río Sinú, and the lower Cauca valley in northern Antioquia through the Department of Magdalena, including the drainage of the Río Ariguaní and the Río Cesar, to the slopes of the Sierra Nevada de Santa Marta, and the western base of the Sierra Negra, the northern extension of the Sierra de Perijá.

---

[3] *In*, Todd and Carriker, Ann. Carnegie Mus., vol. 14, October, 1922, p. 419.

In connection with this brief outline of the range of *atopus* it is of interest to report specimens of *Troglodytes aedon inquietus* from Acandí, in the north of the Department of Chocó, and from Nicoclí, in the far northwest of Antioquia, these being the first records of this race in Colombia. The two localities are on either side of the broad Gulf of Urabá. The race *inquietus* enters this area from Panamá, where it ranges along the north coast except in the northwestern area. It is common in the interior of Darién, but is not yet reported from near the Pacific coast south of the Gulf of San Miguel. I did not find house wrens at Jaqué, nor along the Río Jaqué in Panamá, immediately to the north of the Colombian boundary, in 1946 an 1947, nor have I seen records to the southward along the Pacific coast of the Department of Chocó in Colombia.

In this study, as in another recent one dealing with the birds of Isla Coiba, Panamá, I have treated the house wrens of Central and South America as conspecific with *Troglodytes aedon* of the North. There is evident no clear cut line of demarcation by which to separate the subspecies that have been grouped under the specific name of *musculus.*

Vol. 71, pp. 5-10 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF SOME CONIFER FEEDING APHIDS FROM NEW ENGLAND

By F. C. Hottes

The aphids described in this paper were sent me for determination by A. E. Brower of Augusta, Maine and Louise M. Russell of the United States National Museum.

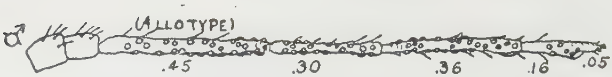
Cinara rigidae n. sp.

Alate viviparous female.

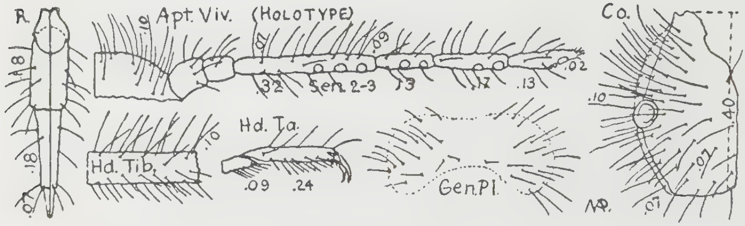
Length from vertex to end of cauda varying from 1.50-2.40 mm. Color notes taken from living specimens not available. When alive most likely black, at least very dark. Color as indicated from cleared mounted specimens as follows: head and thorax deep brownish-black, abdomen brown with the cornicles slightly darker than the abdomen, distinctly dusky. Cauda with outer margin blackish, anal plate black. First and second antennal segments concolorous with head, third antennal segment with basal one fourth pale remainder of segment dark brown, remaining antennal segments quite similar. Segments of all legs a uniform dark brownish-black. Third segment of rostrum spotted except for apical region which is brown, remaining segments of rostrum brownish-black.

Head and thorax.—Ocular tubercles present, small, difficult to differentiate. Median transverse suture well developed, black. Hairs on vertex of head about .07 mm. in length. Hairs on dorsum of head extending to posterior margin, becoming progressively shorter front to rear, all arising from clear areas around base, which makes the dorsum appear to be covered with small light spots. Antennal segments with the following lengths: III .24-29 mm., IV .14 mm., V .17-20 mm., VI .13-.15 + .04 mm. Sensoria distributed as follows: III two to four secondary plus primary, IV one to two secondary plus primary, V one secondary plus primary. All sensoria arranged in a straight row. Hair on antennae fine, set at an angle of about forty-five degrees or slightly more, about .05 mm. in length. Hairs on fourth, fifth and sixth antennal segments slightly longer than those on the third. Rostrum extending beyond apex of abdomen, in one case segments three four and five doing so. Lengths of last three segments of the rostrum as follows: .21, .23 and .10 mm. The fourth segment of the rostrum is quite narrow.

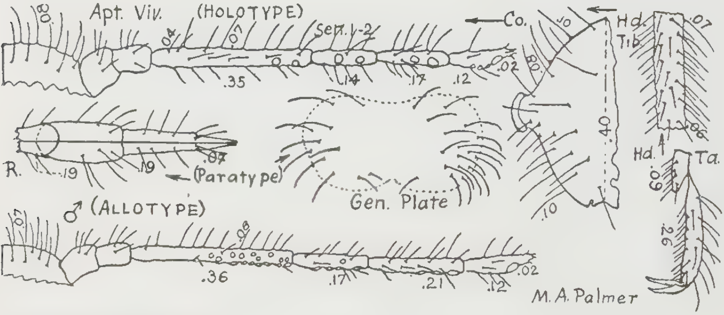
Metathoracic femora varying from .60-.75 mm. Metathoracic tibiae varying from 1.16-1.28 mm. Hairs on metathoracic tibiae fine, numerous, set at an agle of about forty-five degrees on inner margin and slightly



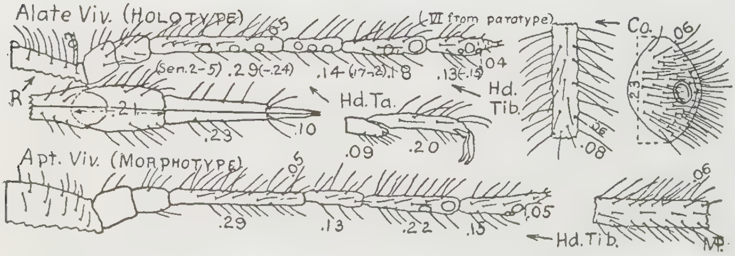
Cinara soplada H.



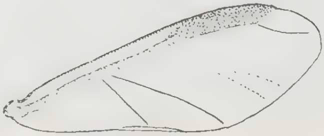
Cinara atripes n.sp.



Cinara pallidipes n.sp.



Cinara rigidae n.sp.



more on outer. The inner margin of the tibiae has the hairs slightly more numerous than the outer, where the hairs are from .06-.08 mm. in length. Length of metathoracic tarsal segments I and II .09 and .20 mm. The first metatarsal segment has about nine hairs on its ventral surface. The media is once branched, the branch being far removed from the margin of the wing.

Abdomen.—Cornicles not always easy to differentiate from abdomen because of similarity of color in some cases, and never differing greatly. Width of cornicles from front to rear varying from .20-.30 mm. the outer margin being quite regular. Hairs on cornicles evenly spaced and of about the same length, being .06 mm. long. Genital plate visible in only one case, and almost totally free from hair. Pigment spot anterior to cauda most likely entire but extremely difficult to differentiate. Cauda pale except for outer margin which is dark due to blackish setulae, the dark portion of the cauda has long hairs.

Apterous viviparous female.

Length 2.40 mm. Length of metathoracic femora .75 mm. Length of metathoracic tibiae 1.07 mm. Cornicle very difficult to differentiate from abdomen because of similarity in color, possibly .18 mm. in diameter. Length of antennal segments as follows: III .29 mm., IV .13 mm., V .22 mm., VI .15 + .05 mm. Third antennal segment without sensoria, fourth antennal segment with only the primary sensorium, fifth antennal segment with one secondary sensorium and the primary. Color in life probably black. Femora and tibiae dark with the basal portions not quite as dark as the apical portions. Hairs on tibiae quite similar to those of the alate viviparous female except for the fact that the hairs on the inner and outer margins are set at the same angle, and are of about the same length. Ventral surface of first metatarsal segment with about nine hairs. Mesosternal tubercle not present.

Hairs on dorsal and ventral surfaces of the abdomen about the same as to length and number, numerous on both surfaces. Pigmented spot anterior to cauda difficult to differentiate, probably divided, in either case with a single row of hairs on the posterior margin.

This species may be easily distinguished from *C. strobi* (F) by the much shorter femora and tibiae, by the hairs on the tibiae being finer, shorter and more upstanding, differently shaped cornicles, and shorter antennae.

Holotype atate viviparous female, morphotype apterous viviparous female. Both types deposited in the United States National Museum. Host *Pinus rigida*. Durham, New Hampshire. July 23, 1921. Collected by Philip R. Lowry and presented to the United States National Museum by Doris Gallup Lowry in 1932.

Cinara atripes n. sp.

Apterous viviparous female.

Length from vertex to end of anal plate varying from 1.67-2.25 mm. Color notes taken from living specimens not available, probably black or blackish-brown. Mounted and cleared specimens indicate the head and thorax as dark dusky-brown. First and second antennal segments concolorous with head, third segment light dusky on basal half, remainder of segment and remaining segments dark dusky, growing progressively darker towards the apex of the antennae. Femora tibiae and tarsal segments of all legs, with the exception of a short distance near the base of the metathoracic femora which is pale, a uniform very dark brownish-black. Cornicles brownish-black. Cauda and anal plate the same.

Head and thorax.—Median transverse suture well developed, black. Ocular tubercles not decernable. Hair on vertex of head .10 mm. in length. Length of antennal segments as follows: III .32 mm., IV .13 mm., V .17 mm., VI .13 + .02 mm. Secondary sensoria distributed as follows: III 0-2 secondary plus primary, IV and V one secondary plus primary. Hair on antennae sparse upstanding, on third segment varying from .07-.09 mm. much more numerous on anterior margin than on posterior margin. Rostrum in larger specimens reaching to orifice of cornicles, in smaller specimens reaching end of abdomen, last three segments of rostrum with the following lengths: .18, .18 and .07 mm. The third segment of the rostrum is free from spots, its basal region is pale, its apex brown, which color continues to the end of the rostrum. The metathoracic femora vary from .75-.78 mm. in length, the hairs on the anterior margin of this segment are about .075 mm. in length, they are quite numerous and upstanding. The metathoracic tibiae vary in length from 1.08-1.17 mm. the hairs on the outer margin of this segment are .10 mm. in length, they are upstanding. The hairs on the inner margin of the metathoracic tibiae are about as long as those on the outer margin but more numerous, and somewhat more inclined. First metathoracic tarsal segment .09 mm. in length, the hairs on ventral surface of this segment number about nine, they are about as long as the width of the segment.

Abdomen.—Cornicles with the diameter measured front to rear .40 mm. orifice near center, outer margin irregular, but not distinctly broken. Hairs on cornicles not numerous but covering entire surface. Hairs on dorsal surface of abdomen not as numerous as those on ventral surface. Pigmented spots anterior to cauda with hairs scattered over all of surface. Anterior to these spots there are two pigmented areas. Cauda and anal plate with numerous hairs.

Holotype apterous, viviparous female deposited in the United States National Museum. Host *Picea glauca* (white spruce) Topsfield, Maine July 8, 1956. Collected by A. E. Brower.

This species differs from *C. soplada* H. by having longer hairs on the tibiae and antennae, darker pro and mesothoracic legs, larger cornicles. From *C. acadiana* H. this species differs by having longer hairs on the tibiae, more rounded cornicles with the margin less broken.

Cinara pallidipes n. sp.

Apterous viviparous female.

Length from vertex to end of cauda 2.18 mm. Color notes taken from living specimens not available. As present in cleared mounted specimens as follows: Head and thorax dark dusky brown. First and second antennal segments concolorous with head. All of third antennal segment except the extreme apex light dusky, apex of third and all remaining antennal segments dusky. All femora with basal portions much lighter than apical portions which are brown. Tibiae with knees brown, this region followed by a wide pale band which shades into dark brown slightly beyond the middle of the segment on the metathoracic pair of legs, this band is much wider on the mesothoracic tibiae. Tarsal segments brown. Apex of second rostral segment brown, remaining segments of the rostrum the same. Basal portion of second rostral segment not spotted. Cornicles dusky black, cauda and anal plate likewise.

Head and thorax.—Median suture of head hardly apparent, not dark. Hairs on vertex of head .08 mm. long, fine. Ocular tubercles poorly developed. Rostrum extending to point just beyond posterior margin of cornicles. Length of antennal segments as follows: III .35 mm., IV .14 mm., V .17 mm., VI .12 + .02 mm. Secondary sensoria distributed as follows: Third and fourth antennal segments with one secondary sensorium plus primary, fifth antennal segment with two secondary sensoria and primary. Antennal hair sparse, fine, upstanding varying in length from .04-.07 mm. Sixth antennal segment slightly imbricated. Mesosternal tubercle absent. Metathoracic femora .93 mm. in length, provided with numerous fine upstanding hairs on the anterior margin which are about .06 mm. in length. Metathoracic tibiae 1.40 mm. in length. Hairs on outer margin of metathoracic tibiae varying from .06-.07 mm. in length, fine, upstanding, remaining hairs on metathoracic tibiae not quite so long less upstanding, more numerous. Hairs on inner apex of metathoracic tibiae abundant. First metatarsal segment .09 mm. in length, ventral surface of this segment with about fourteen hairs. Second metatarsal segment .26 mm. long.

Abdomen.—Cornicles with margins slightly irregular with the width .40 mm. Hairs on cornicles not numerous, varying in length from .08-.10 mm. fewer hairs near margin than on restricted area. Hairs on dorsum of abdomen not numerous, similar to those on the cornicles, hairs on ventral surface of abdomen more numerous than those on the dorsum, but only about half as long. Pigmented areas anterior to cauda with similar pigmented areas anterior to them. Hairs on pigmented spots irregular in distribution. Cauda and anal plate with setulae very well developed, both structures with many hairs.

Apterous male.

Length 1.87 mm. Length of antennal segments as follows: III .345 mm., IV .17 mm., V .21 mm., VI .12 + .02 mm. Length of metathoracic femora .81 mm. Length of metathoracic tibiae 1.25 mm. Length of metathoracic tarsal segments .075 and .22 mm. Width of cornicles front to rear .30 mm. Length of hairs on outer margin of metathoracic tibiae .045 mm. Lengths of last three rostral segments .18, .15, .06 mm. Sensoria on antennal segments distributed as follows: III 13-16, arranged on apical half of segment, irregularly spaced, small, tuberculate. IV 5 arranged on posterior margin. V 3. Hairs on antennal segments few, upstanding, varying in length from .04-.06 mm. Median transverse suture of head well developed, brown, much darker than head. Rostrum extending almost to pigmented spots anterior to cauda. Hairs on cornicles evenly distributed similar in length and character to those on dorsum of abdomen. Hairs on ventral surface of abdomen more numerous than hairs on dorsum, somewhat shorter and finer. Harpagones with a few short hairs at the apex but with numerous hairs elswhere, all of which arise from clear areas. Hairs on tibiae similar to those of apterous viviparous female.

Holotype, apterous viviparous female, allotype apterous male. Host, *Picea glauca* (white spruce). Collected at Topsfield, Maine July 8, 1956 by A. E. Brower. Both types deposited in the United States National Museum.

This species appears to be allied to *Cinara atripes* described herewith, but differs from that species by having shorter less numerous hairs on the antennae and tibiae, by having the tibiae banded with a pale area, and by having fewer hairs on the cornicles, which are also quite similar in color to the abdomen. July eighth would appear to be very early for the taking of a male, a fact which indicates that few generations of this species are produced in a season in the type locality, and which may also explain why this species has not been observed and described before now.

Cinara soplada H.

Alate male.

Length from vertex to end of cauda 1.92 mm. Length of antennal segments as follows: III .45 mm., IV .30 mm., V .36 mm., VI .16 + .05 mm. Length of metathoracic femora 1.20 mm. Length of metathoracic tibiae 1.98 mm. Length of metathoracic tarsal segments .105 and .27 mm. Width of cornicles .12 mm. Last three segments of the rostrum with the following lengths: .225, .18 and .06 mm. Sensoria distributed as follows: III 39-48, IV 36-46 V 29-33 VI 6. All of the sensoria are tuberculate and vary in size. Primary sensoria on the third and fourth segments similar to the secondary sensoria on these segments. Antennal hair sparse, most likely due to the excessive amount of surface taken up by the sensoria, most numerous on the fifth segment. All antennal hairs fine and about .03 mm. in length. First and second antennal segments dark dusky, third antennal segment with the base pale, remainder of segment dusky, all remaining antennal segments dusky becoming progressively darker towards the apex. Surface of antennae not taken up by sensoria rough, with the sixth segment distinctly imbricated, and the surface of the fifth slightly so. Rostrum extending beyond the body. Media of fore wings twice branched, the second branch far removed from the margin of the wing. All tibiae uniformaly dark dusky. Metathoracic tibiae with the hairs set at an angle of about forty-five degrees, fine, about .045 mm. in length, the same on the outer and inner margins. Hairs on ventral surface of first metatarsal segment numerous, extending throughout most of length. Cornicles with comparatively few hairs. Cauda triangular. Harpagones with a few short hairs near the ends, remainder of harpagones with long hairs.

Allotype alate male, deposited in the United States National Museum. Host, *Picea glauca* (white spruce), Bar Harbor, Maine December 9, 1956 Coll. A. E. Brower.

Vol. 71, pp. 11-12 April 11, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GRAY-CROWNED ROSY FINCH FROM NORTHERN ALASKA

By Bernard Feinstein*

A comparison of a series of twelve May and June specimens (7 males, 5 females) of *Leucosticte tephrocotis* collected in the Brooks Mountains of Alaska for, and by, Dr. L. Irving show distinct characteristics by which these northern Alaskan specimens can be separated from their closest (in appearance) relatives, *Leucosticte tephrocotis tephrocotis*. The Brooks Mountains specimens possess a brighter tone to the brown coloration found above and below. This brown apparently contains more of a reddish color, which is best noted on the under surface, than *L. t. tephrocotis*. The extent of red coloring on the rump, uppertail coverts and abdomen is of a deeper quality (quite similar in appearance to that found in *L. t. littoralis*), and on the under surface it covers a more extensive area than in *L. t. tephrocotis*. In addition the Brooks Range specimens possess a distinct gray occipital band which separates the black of the pileum from the brown of the back. This character is more noticeable in the males than in the females.

The differences stated above were first noted by Drs. Friedmann and Irving. Sometime before these specimens were given to me to examine another group of three July specimens were sent to Dr. Friedmann by Dr. Brina Kessel of the University of Alaska for positive identification. These specimens were collected in the mountains at the head of the Sheenjek River, Yukon Territory and Dr. Friedmann noted that "these agree with Irving's series in having more and deeper pink on the lower underparts and the rump . . . are worn . . . but they go together with the Anaktuvuk series."

On the basis of a definite distinction of the twelve summer specimens from the Brooks Range and the three specimens from the Sheenjek River, a new race is to be named, in honor of Dr. Laurence Irving, and described as follows:

Leucosticte tephrocotis irvingi subsp. nov.

Subspecific characters.—Differs from *L. t. tephrocotis* in averaging brighter colored above and below. The feathers of the dorsal tract having their web color, aside from the dark median streak, close to cinnamon brown with light edges rather than Saccardo's umber with light edges as found in *L. t. tephrocotis;* the pileum averaging and appearing blacker; a definite gray occipital band separating the pileum from the back color; the red feather edging of the rump and uppertail coverts averaging a deeper red, more purplish; the malar and auricular regions darker; tertial edgings a deeper red, more purplish; the abdominal red-edged feathers are also a deeper red and are more extensive in their distribution.

---

*Published with Permission of the Secretary of the Smithsonian Institution.

Type.—U. S. Nat. Mus. no. 435409, adult male taken June 29, 1949 at Anaktuvuk Pass, Alaska by T. Brower with an original no. A493a.

Measurements.—Male (7 specimens), wing (chord), 104.4-110; (average 106.9); tail, 63.8-70 (66.8); culmen, 11.0-12.2 (11.5); tarsus, 19.3-20.4 (19.9); middle toe without claw, 14.0-15.2 (14.1) mm. Female (5 specimens), wing, 100.5-102.5 (101.8); tail, 62.0-65.2 (64.2); culmen, 11.2-11.8 (11.6); tarsus, 19.0-20.7 (19.8); middle toe without claw, 14.0-14.3 (14.2) mm.

Range.—Known only from the Brooks Mountains and immediate vicinity.

Remarks.—A comparison of the Brooks Range series with *L. t. littoralis,* which is its nearest relative geographically, shows a slight inclination towards *littoralis* in coloration. However, the series of *irvingi* lacks the gray malar area and auricular region. *L. t. littoralis* is a smaller form than either *irvingi* or *tephrocotis.* There are no mensural differences by which *irvingi* can be distinguished from *tephrocotis.* The following measurements of the comparative breeding series of *tephrocotis* and *littoralis* are given to show the size variation and as an aid in comparing the three forms. *L. t. tephrocotis:* male (5 specimens), wing, 104.5-108.2 (105.7); tail, 62.5-67.1 (64.6); culmen, 11.0-11.6 (11.3); tarsus, 19.3-20.7 (19.9); middle toe without claw, 14.5-15.2 (14.8) mm. Female (6 specimens), wing, 100.0-104.1 (101.4); tail, 56.7-65.3 (61.8); culmen, 11.2-11.8 (11.5); tarsus, 18.2-19.3 (19.0); middle toe without claw, 14.1-15.0 (14.3) mm. *L. t. littoralis:* male (8 specimens), wing, 99.0-105.8 (103.1); tail, 58.2-66.7 (63.2); culmen, 10.5-11.1 (10.9); tarsus, 19.1-20.4 (19.9); middle toe without claw, 14.0-14.8 (14.3) mm. Female (6 specimens), wing, 94.0-100.2 (95.8); tail, 57.2-61.0 (58.5); culmen, 10.2-11.6 (10.9); tarsus, 19.0-20.4 (19.6); middle toe without claw, 14.0-15.0 (14.3) mm.

The comparative breeding material was selected from the northern portions of the United States and all localities to the north. This will explain why the *tephrocotis* series measured is so small. The large Californian breeding series in the U. S. Nat. Mus. collection was measured and compared and was found to agree with the more northern representatives of *L. t. tephrocotis.* The northernmost record for the nominate race is from Mountains near Eagle, Alaska. An attempt was made to borrow material from the intervening area, that is, from Eagle to the Brooks Range, but no other institutions were found to possess specimens from this questionable area. In the U. S. Nat. Mus. collection there are four winter specimens from this area; the area to the south of the Brooks Range. Two specimens are from Bettles and two are from Boulder Creek, a tributary of the Cheena River. All four specimens were collected in the month of October and were referred to *Irvingi.* It appears that *irvingi* is geographically isolated from the other races of the species by hundreds of miles of terrain apparently unsuitable for a rosy finch.

Vol. 71, pp. 13-16 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TECHNICAL NAMES OF THE SOUTH AMERICAN MARSH DEER AND PAMPAS DEER

By Philip Hershkovitz
Curator of Mammals, Chicago Natural History Museum

The generic name *Edocerus*, with type *Cervus dichotomus* Illiger, was proposed by Avila-Pires (1957) for the South American marsh deer currently known as *Blastocerus*. According to Avila-Pires the name *Blastocerus* is based on the pampas deer and should, therefore, displace *Ozotoceros* Ameghino. The arguments raised for the nomenclatural changes do not take into account all the known facts.

Ameghino (1891:243) proposed *Ozotoceros*, with type the pampas deer (*Ozotoceros campestris* authors, not Cuvier = *bezoarticus* Linnaeus), to replace ''*Blastoceros* [*sic* =*Blastocerus*, not *Blastoceros* Fitzinger] Gray, 1872,'' erroneously held to be pre-occupied by *Blastocera* Gerstaecker, 1856, a genus of Diptera. In this particular case, the designated type species of *Ozotoceros* automatically becomes the type of ''*Blastocerus* Gray, 1872.'' Both the pampas deer and the marsh deer, *Cervus paludosus* (= *C. dichotomus*) were included in ''*Blastocerus* Gray, 1872.'' Under no circumstances, however, can it be assumed, as Avila-Pires does, that the type of *Ozotoceros* becomes, *ipso facto*, the type of *Blastocerus* as proposed by any author prior to Gray, 1872. Indeed, *Blastocerus*, as understood and constituted by earlier authors is not the same as ''*Blastocerus* Gray, 1872.''

The first use of *Blastocerus* as a valid generic name dates from Gray, 1850. The type and only species of *Blastocerus* Gray, 1850, is the marsh deer, *Blastocerus paludosus* Desmarest, with the *guazu-pucu* of Azara and *Cervus dichotomus* Illiger included as absolute cynonyms. Patently, *Ozotoceros* Ameghino and *Blastocerus* Gray, 1850, are not synonymous.

In errecting the genus *Blastocerus* for the marsh deer, Gray (1850:68) cited Wagner and Sundevall as authorities for the name. However, neither author employed the term in any form that could be accepted as a generic or subgeneric taxon.

Wagner's classification of deer in the fourth supplement to Schreber's ''Säugthiere'' published 1844, and in the fifth supplement published in 1855, leaves no room for equivocation. The deer in question are here actually contained within the genus *Cervus*, subgenus *Elaphus* (cf. 1844: ix, 339, 341, 348, 367, 368; 1855: xv-xvi, 352, 367, 368). ''Blastocerus'' is introduced by Wagner (1844: 366) as a diagnostic term for a species group contained within the subgenus *Elaphus.* The group consists of the marsh deer (*Cervus paludosus* [=*dichotomus*]), the pampas deer (*C. campestris* [=*bezoarticus*]) and the mule deer *C. macrotis* (=*hemionus*). At the same time, Wagner (**1844**:384) uses the term ''Furcifer'' for another superspecific category of subgenus *Elaphus.* This subdivision held only the Peruvian *taruga* (*Cervus antisensis* I. Geoffroy and Blainville).

In 1855, Wagner (p. 346) reviewed the taxonomic literature on deer contributed since 1844. He acknowledged Gray, 1850, as author of several generic names, including *Blastocerus* and *Furcifer.* In his own classification, however, Wagner (**1855**:349-350) kept ''Blastocerus'' in its original status as a diagnostic term for a species group within the subgenus *Elaphus. Furcifer,* on the other hand, was removed from *Elaphus* and given equal rank as a subgenus of *Cervus* (op. cit., pp. 350, 380).

In his arrangement of the Pecora, Sundevall (**1846**: 182-183) used the plural form ''Blastoceri'' as the term for a division of *Cervus.* It contained only the marsh deer, *Cervus paludosus.* The pampas deer, *C. campestris,* was referred to the ''Furciferes'' division of *Cervus.*

Admission of the terms ''Blastocerus'' and ''Furcifer'' from Wagner, 1844, ''Blastoceri'' and ''Furciferes'' from Sundevall, 1846, as valid generic or subgeneric names is not in harmony with their authors' concepts of classification or with the binomial system of nomenclature. A number of other Latin terms used by Wagner in the diagnoses of special species groups have crept into the literature as generic and specific taxons. They need not be exposed at this time.

The above conclusions are in agreement with those presented by Cabrera in 1943 (pp. 14-15). Avila-Pires cites Cabrera's paper but, it appears, has grossly misrepresented its meaning. Simpson (**1945**: footnote 5, p. 154) likewise failed to grasp the significance of the difference between ''Blastocerus'' Wagner, 1844, and *Blastocerus* Gray, 1850. His suggestion that *Dorcelaphus* Gloger, 1841, an absolute synonym of *Odocoileus* Rafinesque, could be the correct name for the marsh deer, cannot be taken seriously.

Another name for marsh deer that must be reckoned with is *Bezoarticus* Marelli. The name was erected in 1931 (p. 57) as a subgenus of ''Blastocerus Wagner, Proc. Zool. Soc. London, 1850, p. 237.'' Its type by monotypy is the marsh deer, *Blastocerus paludosus* Desmarest. Marelli also listed the pampas deer, *Blastocerus campestris,* with synonym *Blastocerus bezoarticus.* It would seem that Marelli might have included this tautonymic species in his *Bezoarticus* but this is not evident from the text. In any case, the pampas deer becomes, by elimination, type of the nominate form of the genus *Blastocerus* as understood by Marelli.

Turning now to the pampas deer, the earliest generic name based on it is not *Ozotoceros* Ameghino. In 1860, Fitzinger (p. 176) proposed *Blastoceros* exclusively for this animal. There is no indication in the text of his work that Fitzinger adopted the name from either Wagner, 1844, or Gray, 1850. Whether or not it should be regarded as an invalid emendation, *Blastoceros* Fitzinger as a name is valid, and no more a homonym of *Blastocerus* Gray, 1850, than is *Blastocera* Gerstaecker, 1856.

Some confusion may result from the near identity of the generic names for marsh and pampas deer. This problem may eventually be resolved within the scope of a taxonomic revision of all Neotropical cervids. For present purely nomenclatorial purposes, however, the available names for the deer in question may be summarized as follows:

Blastocerus Gray (Marsh deer)

Blastocerus Gray, 1850, Gleanings Knowsley Menag., p. 68—type *Blastocerus paludosus* Desmarest [=*Blastocerus dichotomus* Illiger] by monotypy; generic name derived from ''Blastocerus'' Wagner, 1844 (Schreber's Säugthiere, Suppl. **4**:366), a term for a species group of subgenus *Elaphus*, genus *Cervus*. Lydekker, 1915, Deer of all lands, p. 282—name erroneously attributed to Sundevall (1846, K. Vet. Akad. Handl., 1844:182) where only the plural Latin term ''Blastoceri'' is used.

Blastoros Knottnerus—Meyer, 1907, Arch. Naturg., Berlin, (73), **1**:19—misprint for *Blastoceros* [sic] Gray.

Bezoarticus Marelli, 1932, Mem. Jardin Zool. La Plata (1930-1931), **4**:57—subgenus of ''*Blastocerus* Wagner [Gray], Proc. Zool. Soc. London, 1850, p. 237''; type by monotypy, *Blastocerus paludosus* Desmarest [=*Blastocerus dichotomus*].

Edocerus Avila-Pires, 1957, Bol. Mus. Nac. Rio de Janeiro, n.s., no. 153, p. 5—type *Edocerus dichotomus* Illiger, by original designation.

Dorcelaphus Knottnerus—Meyer (Not Gloger, 1841), 1907, Arch Naturg., Berlin, (73), **1**:19, 98—included species, *D. dichotoma* Illiger; offered as substitute for *Blastoceros* [sic] Gray, 1850.

Blastoceros Fitzinger (Pampas deer)

Blastoceros Fitzinger, 1860, Naturg. Säugeth., **3**:176—type, *Blastoceros campestris* [=*Cervus bezoarticus* Linnaeus], by monotypy.

Ozotoceros Ameghino, 1891, Rev. Argentina Hist. Nat., **1**:243—type, *Ozotoceros campestris* [not Cuvier = *Cervus bezoarticus* Linnaeus]; name proposed as a substitute for ''*Blastoceros* [sic] Gray, 1872'' [not *Blastocerus* Gray, 1850] erroneously regarded as preoccupied by *Blastocera* Gerstaecker, 1856, a genus of Diptera.

Ozotoceras [sic] Palmer, 1904, Index Gen. Mamm., N. A. Fauna no. **23**:492—lapsus for *Ozotoceros* Ameghino.

Ozelaphus Knottnerus—Meyer, 1907, Arch. Naturg., (73), **1**:19, 98, 110—included species: *azarae* Fitzinger [=*bezoarticus* Linnaeus], *bezoarticus* Linnaeus [=type, by virtual monotypy].

LITERATURE CITED

Ameghino. 1891. Mamíferos y aves fósiles argentinas.—Especies nuevas, adiciones y correcciones. Rev. Argentina Hist. Nat., **1**:240-259.

Avila-Pires, Fernando Dias de. 1957. Um novo género para o ''cervo'' ou ''Veado do pantanal.'' Bol. Mus. Nac. n.s., Rio de Janeiro, Zool. no. **153**: 1-10.

Cabrera, Angel. 1943. Sobre la sistemática del venado y su variación individual y geográfica. Rev. Mus. La Plata (n.s.), 3, Zool., pp. 5-41, 6 figs.

Fitzinger, Leopold Joseph. 1860. Wissenschaflich—populäre Naturgeschichte der Säugethiere in ihren sämmtlichen Hauptformen. Wien, **4**:520 pp.

Gray, John Edward. 1850. Gleanings from the menagerie and aviary at Knowsley Hall. Hoofed Quadrupeds. Knowsley, 76 pp., 62 plates.

———— 1872. Catalogue of ruminant Mammalia (Pecora, Linnaeus) in the British Museum. viii+102 pp., 4 pls.

Marelli, Carlos A. 1932. Los vertebrados exhibidos en los zoológicos del Plata. Mem. Jardín Zool. La Plata, (1930-1931), **4**:274 pp., 79 pls.

Simpson, George Gaylord. 1945. The principles of classification and a classification of mammals. Bull. Amer. Mus. Nat. Hist., 85: xvi+350 pp.

Sundevall, Carl J. 1846. Methodisk ofversigt af Idislande djuren, Linnés Pecora. Kg. Vet.-Akad. Handl., Stockholm, **1844**: 121-210, pls. 13-14.

Wagner, Johann Andreas. 1844. Die Saugthiere in Abbildungen nach der Natur mit Beschreibungen von Dr. Johann Christian Daniel von Schreber. Erlangen. Supplementband 4: xii + 523 pp.

———— 1855. Die Säugthiere in Abbildungen nach der Natur mit Beschreibungen von Dr. Johann Christian Daniel von Schreber. Leipsig, Supplementband 5: xxvi + 810 pp., 51 pls.

Vol. 71, pp. 17-20 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE TAXONOMIC STATUS OF PEROMYSCUS ALLEX OSGOOD

By Robert L. Packard
Museum of Natural History, University of Kansas

Peromyscus [= *Baiomys*] *allex* Osgood was regarded as a synonym of *Baiomys taylori paulus* J. A. Allen, 1903, from 1909 to 1952. Since 1952 *allex* has been a synonym of *Baiomys taylori analogous* Osgood, 1909. In 1904 Osgood described *allex* (Proc. Biol. Soc. Washington, vol. 17: 76-77) on the basis of ten specimens from the city of Colima, Colima, Mexico. According to the original description *allex* resembled *Baiomys musculus musculus* in color, but differed from it in the smaller size of the body and skull. Osgood noted (*loc. cit.*) that *allex* was almost equal in size to *Baiomys taylori taylori*. However, *allex* differed from *taylori* in having a narrower and more elongate braincase. Osgood indicated that *allex* was like *paulus* in size of body and shape of cranium, but differed from it in color. In his ''Revision of the mice of the American Genus Peromyscus'' (N. Amer. Fauna, 28: 255, April 17, 1909) Osgood chose to synonymize *allex* with *paulus*. This choice in the assignment of *allex* to *paulus* produced a hiatus in the known geographic range of *paulus*. Furthermore, this hiatus was occupied by a part of the geographic range of another named subspecies of *Baiomys taylori, B. t. analogus*. In 1952 Hall and Kelson (Univ. Kansas Publ. Mus. Nat. Hist., vol. 5: 368, Dec. 15) synonymized *allex* with *analogous*. Their decision was based upon comparisons of topotypes of *allex*, *analogous*, and *paulus;* two specimens of equal age and the same sex of *allex* and *analogous* were almost equal in size. In color, topotypes of *analogous* averaged darker than those of *allex*. One specimen of *analogous* (120267 BS) was seemingly indistinguishable from the paratypes of *allex*. On the basis of their report the correct name for this population should have been *Baiomys taylori allex* Osgood, 1904 (they failed to realize that *allex* had priority over *analogous* and used the latter name).

Examination of all of the original materials (holotypes and paratypes) pertinent to this problem in the course of my present study of the Genus *Baiomys* leads me to the opinion that Osgood's *allex* should not be synonymized with either *paulus* or *analogous* (both of these are distinct subspecies of *Baiomys taylori*), but instead, that *allex* should be recognized as another distinct subspecies of *Baiomys taylori.* The name applicable to this population is *Baiomys taylori allex* Osgood, 1904. From paratypes of *Baiomys taylori paulus, B. t. allex* differs in: Unicolored instead of bicolored tail; belly paler; feet more sooty dorsally; 9 of 13 external and cranial measurements averaging smaller (see table 1). Owing to the small size of the sample the differences in measurements may not be significant. From paratypes of *Baiomys taylori analogous, B.t. allex* differs in: Ventral part of forelegs and belly whitish, instead of gray; dorsum fawn colored with gray overtones, instead of blackish-sepia; external and cranial measurements averaging smaller throughout (see table 1), but as previously mentioned the size differences may not be significant owing to the small size of the sample. The several differences in color of *allex* are alone sufficient to separate it from either *analogous* or *paulus.*

B. t. allex is known only from the type locality but may occur in northern Colima, the western part of Jalisco, and the southern part of Nayarit.

I am grateful to Mr. George G. Goodwin, the American Museum of Natural History, for permission to examine the holotype and paratypes of *Baiomys taylori paulus,* and to Dr. David H. Johnson, United States National Museum, for permission to examine the other mentioned material.

Transmitted December 16, 1957.

Table 1. Average and extreme measurements, in millimeters, of three subspecies of *Baiomys taylori*

	Total length	Tail vertebrae	Length of body	Hind foot	Occipitonasal length	Zygomatic breadth	Postpalatal length	Least interorbital breadth	Length of incisive foramina	Length of rostrum	Breadth of braincase	Depth of cranium	Alveolar length of maxillary tooth-row
Baiomys taylori allex, Colima, Colima													
Number of specimens	9	8	9	9	6	9	6	9	9	8	8	7	9
Average	105.5	42.0	63.1	13.3	17.8	9.3	6.5	3.4	3.7	5.7	8.5	6.4	3.0
Minimum	100.0	38.0	58.0	13.0	17.5	8.8	6.2	3.2	3.5	5.4	8.3	6.1	2.8
Maximum	113.0	47.0	68.0	14.0	18.4	9.7	6.7	3.5	3.8	6.0	8.8	6.6	3.0
Baiomys taylori paulus, Río Sestín, Durango													
Number of specimens	6	6	8	9	5	5	5	6	6	5	5	5	6
Average	109.0	44.5	63.0	13.1	17.5	9.3	6.6	3.5	3.8	5.9	8.6	6.6	3.2
Minimum	106.0	43.0	57.0	12.7	17.4	9.1	6.2	3.4	3.6	5.7	8.5	6.2	3.1
Maximum	117.0	48.0	69.0	14.0	18.0	9.5	6.9	3.6	4.1	6.0	8.8	6.9	3.4
Baiomys taylori analogous, Zamora, Michoacán													
Number of specimens	9	9	9	9	8	9	8	9	9	9	9	8	9
Average	109.7	43.8	65.9	14.4	18.0	9.5	6.6	3.5	4.0	6.0	8.7	6.5	3.1
Minimum	100.0	36.0	60.0	13.5	17.6	9.1	6.3	3.3	3.6	5.6	8.4	6.3	3.0
Maximum	123.0	53.0	72.0	15.0	18.6	9.9	6.9	3.8	4.2	6.6	9.0	6.8	3.2

Vol. 71, pp. 21-26 April 11, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MISCELLANEOUS PREY RECORDS OF SOLITARY WASPS. III* (HYMENOPTERA, ACULEATA)

By Karl V. Krombein
Entomology Research Division, Agricultural Research Service
United States Department of Agriculture

Almost all the biological observations reported here were made at Plummers Island, Maryland, and at my home in Arlington, Virginia. At Plummers Island observations were made on several species of ground-nesting wasps, and on some wood-nesting species that utilized the abandoned frass-filled burrows (2-3 mm. in diameter) of anobiid beetle larvae in steps and rafters of the cabin porch. All the species observed in Arlington were nesting in abandoned anobiid borings in the wooden wall of an old, disused cowshed.

The opportunity is also taken to present some brief descriptive notes of the hitherto unknown male of the rare sphecid wasp, *Xysma ceanothae* (Viereck).

I am indebted to the following specialists for the identification of prey or parasites of the wasps: H. C. Huckett (Muscidae), B. J. Kaston (Araneae), P. W. Oman (Cicadellidae, in part), K. O'Neill (Thripidae), L. M. Russell (Aphididae), W. W. Wirth (Tendipedidae), and D. A. Young, Jr. (Cicadellidae, in part).

Pompilidae

Calicurgus hyalinatus alienatus (Smith)

A female (61157 J), 9.7 mm. long, was captured with her paralyzed spider prey on June 11, 1957, on Plummers Island. She was dragging the spider over leaf litter near the cabin woodpile. The spider was a female epeirid 6.7 mm. long and about three-fourths grown, belonging to a species of *Neoscona.*

Sphecidae

Trypoxylon (Trypoxylon) backi Sandhouse

Two females (92157 B and C), 4.9 and 6.3 mm. long, were collected with their paralyzed spider prey on the cowshed wall in Arlington on

---

*Preceding parts of this series were published in Bull. Brooklyn Ent. Soc. 50: 13-17, 1955, and 51: 42-44, 1956.

September 21, 1957. The spiders were specimens of the liniphyiid, *Tennesseelum formicum* (Emerton), 1.1 and 1.7 mm. long, a penultimate instar male (92157 B) and adult female (92157 C). This wasp is multivoltine in Arlington.

Diodontus (Diodontus) atratus parenosas Pate

A female (92157 A), 5.7 mm. long, was taken on the cowshed wall in Arlington at the entrance of her burrow, September 21, 1957. She was carrying a paralyzed aphid nymph, 1.5 mm. long, of a species of *Drepanaphis.* This wasp is multivoltine in Arlington.

Mimesa (Mimesa) basirufa Packard

One female (61157 K), 9.2 mm. long, was taken June 11, 1957, on Plummers Island near the outdoor fireplace. She was flying with her paralyzed prey, an immature leafhopper, 3.2 mm. long. The cicadellid was probably a fourth-instar nymph of a species of *Idiocerus.*

Xylocelia virginiana Rohwer

I have made limited observations on several colonies of this species. Members of the earliest colony were nesting in pockets of soil formed between the roots of some uprooted tree stumps in Forest Lawn Cemetery, Buffalo, New York. Ten females and two males were taken between June 20 and July 13, 1934. One female on June 21 was transporting her prey, a paralyzed adult leafhopper, 4 mm. long, of a species of *Typhlocyba.* There was one generation a year at Buffalo, for no specimens were taken the rest of the summer of 1934. This colony was active again in June 1935.

There are two colonies located about 10 meters apart on the flat ground behind the cabin on Plummers Island. No observations were made on the nesting activities in 1956, but three females and four males were taken June 29 and July 11. In 1957 the larger colony consisted of about 50 females nesting in an area somewhat over 2 square meters. Adults were active from at least June 11 to July 2. Both sexes were flying low over the ground or alighting on the ground at 10 a.m., June 11. Several of the males attempted unsuccessfully to mate by pouncing on females on the ground. The females were digging burrows or provisioning their nests. The individual burrow entrances resembled small anthills, the fine grains of excavated soil being around the entrances in spoil heaps about 25 mm. in diameter and 3 to 6 mm. in height. The burrows penetrated the soil at an angle of 35° to 45° and varied considerably in the details of construction. Some went downward for 25 to 30 mm., then turned at right angles and continued down for another 25 mm. at the same angle. Others had an angulation only 10 mm. from the entrance and an additional angulation in another 20-25 mm. One was a straight shaft 32 mm. long.

All wasps at Plummers Island were provisioning with nymphs of *Prociphilus tesselatus* (Fitch), the woolly alder aphid. Nine aphids taken with or from wasps or found in burrows on June 11 (61157 A and C-I) ranged from 3.1 to 4.6 mm. in length (female wasps were 6.9 to 7.7 mm. long). I did not observe prey capture, but most of the woolly bloom is rubbed off the aphids during the process. The aphids are almost bare when they are brought into the burrows, and the head and thorax of the wasps are coated with the pale bluish bloom from the aphids. Members of the colony in 1956 probably stored the same aphid, for female wasps taken on June 29 and July 11 were similarly coated. The prey is held in the mandibles during transport. Provisioning continued from 10:15 a.m. until 3:55 p.m., and wasps were still flying about when I left at 4:10. The burrow entrance is left open when the wasp departs on a provisioning flight. After returning with prey, the wasp pushes up a plug of loose soil from within (based on one observation).

An attempt was made to rear the contents of two cells found 25-30 mm. below the surface. These were the only completely provisioned cells that I found. The other burrows that I excavated contained only one or two aphids at the most and no eggs. Each of the completely stocked cells held five aphids, and one contained a newly hatched wasp larva, the other a wasp egg. The egg was 1.5 mm. long and 0.45 mm. wide at the middle, and the head end was a little broader than the tail end. It was attached to one of the aphids at the base of the second abdominal sternum along the midline and extended forward between the coxae to the hind margin of the anterior pair. The egg hatched between 9:30 p.m., June 12, and 6 p.m., June 13, and the newly eclosed larva began to feed through the middle of the thoracic sternum between the fore and mid coxae with its tail still attached to the second sternum. This larva was killed by mold on the following day. The older larva was larger but still feeding on the original aphid at 9:30 p.m., June 12. It finished its allotment of aphids by noon of June 15 and was then preserved for taxonomic study.

Many females of an Holarctic muscid *Leucophora sociata* (Meigen) were active on the ground in both nesting sites of *Xylocelia* at Plummers Island on June 11. Some of the flies seemed to be interested in the burrow entrances, though no oviposition was noted nor were any flies seen entering the burrows. Others dashed aggressively at wasps bringing in prey. Although additional observations are needed to determine the precise relationship between *Xylocelia virginiana* and *Leucophora sociata,* the following observations made in Scotland on the relationship between the bee *Andrena analis* Zett. and *Leucophora grisea* (Fall.) are rather illuminating. Huie (Scottish Naturalist, No. 49, pp. 13-20, 1916) found these two species in association. The flies remained in the nesting area and showed an interest only in those bees bringing in a load of pollen. After the bee had deposited her pollen load in the cell in the ground and departed on another provisioning flight, the fly might back into the burrow and deposit an egg about 10 mm. from the entrance and some distance from the cell. Huie found maggots, from which *L. grisea* emerged subsequently, feeding on the stored pollen, one to a cell, but never any bee larva, alive or dead, in such a cell. Her observations, however, do not rule out the possibility that the newly hatched maggot might destroy the host egg before beginning to feed on the stored pollen. Such an act would parallel the behavior pattern of newly hatched larvae of such diverse social parasites as the Miltogrammini in the Sarcophagidae, the Chrysididae, *Coelioxys* in the Megachilidae, as well as other genera of parasitic bees.

Another possible parasite of *X. virginiana* is the mutillid *Ephuta scrupea* (Say). One female was crawling over the ground in a nesting area on June 11. It feigned death when disturbed.

I was unable to visit Plummers Island between June 12 and July 1, 1957, but my colleague, G. B. Vogt, was kind enough to make some observations on the colony during my absence. On June 16 he saw three wasps bring in aphids during a 15-minute period; several specimens of *Leucophora* were present in the area but no *Ephuta* were seen; several wasps engaged in excavating burrows had no aphid bloom on head and thorax. On June 23 he saw several *Xylocelia,* two of them engaged in excavation, and two *Leucophora;* no aphids were brought in during a 15-minute observation period. There was no activity on June 25 after a heavy rain, nor was there any on June 28. I looked intermittently for *Xylocelia* between 8:30 a.m. and 1:30 p.m. on July 2 without success. At 1:40 I captured one female on the ground without prey or aphid bloom—its mandibles were very worn. I saw another female at 1:45, likewise without prey or aphid bloom. Apparently this wasp is univoltine on Plummers Island as in Buffalo, New York, for no specimens were seen during the rest of the summer.

Stigmus americanus Packard

This species was nesting in large numbers in my cowshed wall during the entire summer of 1957. Females ranged from 4.0 to 4.7 mm. in length, and their aphid prey from 1.6 to 2.0 mm. All aphids taken with wasps during the latter part of the season were nymphs, except 91557 B which was an adult. The aphids were identified as follows:

9157 B, September 1, with *Drepanaphis* sp.
9257 A, September 2, with *Drepanaphis* sp.
91557 B, September 15, prey belonging to Panaphini (?)
91557 C, September 15, with *Drepanaphis* sp.
92257 A, September 22, with *Drepanaphis* sp.

This species was also nesting in the porch beams of the cabin at Plummers Island. Three wasps (83157 B-D), 4.8-5.4 mm. long, were taken with paralyzed nymphs of *Drepanaphis* 1.2-1.9 mm. long, August 31, 1957. This wasp is multivoltine in the metropolitan area of Washington.

Stigmus fraternus Say

Two females (91457 A and 92257 B), 4.7 mm. long, were captured September 14 and 22, 1957, on the cowshed wall in Arlington. The prey of 91457 A was an aphid nymph 0.9 mm. long belonging to a species of *Therioaphis,* and the prey of 92257 B was an aphid nymph 1.4 mm. long of a species of *Monellia.*

Passaloecus annulatus (Say)

This species nested both at Arlington and at Plummers Island in the habitats noted under *Stigmus americanus.* Two wasps (9157 C and 92157 D), 4.6 and 5.1 mm. long, were captured in Arlington, September 1 and 21, 1957, with paralyzed aphid nymphs 2 mm. long belonging to a species of *Macrosiphum* and to a species of *Drepanaphis.* Another (9257 C), 5.0 mm. long, was taken on Plummers Island, September 2, 1957, with an aphid nymph 1.4 mm. long belonging to a species of *Drepanaphis.* This species is multivoltine in the metropolitan area of Washington.

Passaloecus mandibularis (Cresson)

Two females (53057 A and C) 5.9-6.1 mm. long, were taken on my cowshed wall in Arlington, May 30, 1957. Each was clutching a paralyzed wingless aphid by the neck. The aphids were 2.2-2.3 mm. long, 53057 A an adult and 53057 C a nymph, and belonged to *Macrosiphum rosae* (L.). This wasp is univoltine in Arlington.

Passaloecus relativus Fox

This species was nesting in the same habitat as *P. mandibularis.* One female (53057 B), 5.0 mm. long, was taken May 30, 1957, with a wingless aphid nymph, 1.7 mm. long. Another (6157 B), 4.5 mm. long, was captured June 1, 1957, with a wingless aphid nymph, 1.3 mm. long. This wasp also carried its paralyzed prey by clutching its mandibles around the aphid's neck. Both specimens of prey belonged to a species of *Aphis.*

Xysma ceanothae (*Viereck*)

This tiny wasp (females are 2.2-2.5 mm. long) is one of our rarest species, and through 1945 was known from just a very brief series of females. In 1954 I was fortunate enough to find a thriving colony nesting in my cowshed wall in Arlington, and I collected 27 females and 3 males between May 31 and June 13. Females were entering deserted anobiid borings, where presumably they nested in tiny galleries excavated in the anobiid frass as do some species of *Spilomena.* Nine of the females taken between June 2 and 12 were engaged in prey transport. Each carried a tiny, pale green thrips larva, venter to venter, its mandibles clutched around the neck of the thrips. The thrips larvae ranged from 0.84 to 1.01 mm. in length. Prey-laden wasps were taken from 10:15 a.m. to 4:15 p.m.

The species is nesting in much smaller numbers in rafters of the cabin porch on Plummers Island. Two females (62956 A and B) were taken June 29, 1956. Each was carrying a second-instar thrips larva 0.89 mm. long of a species of Thripinae (?). Another female (61157 L) was collected June 11, 1957, carrying a thripine (?) larva 0.80 mm. long. Miss O'Neill states that this is likely to be a flower thrips.

Since the male has never been described, it seems desirable to add a few descriptive notes detailing its differences from the female as redescribed by Pate (Trans. Amer. Ent. Soc. 63:97-98, 1937).

Length 2.1-2.3 mm. Black and shining; the following ivory—mandible except apex which is light red, clypeus, subquadrate spot on front on either side of median lobe of clypeus which extends upward one-third of distance to anterior ocellus, scape beneath, malar space, anterior third of head beneath including mouthparts, proepisternum, fore coxa and trochanter; the following light fulvous—scape above, flagellum, foreleg except coxa and trochanter, mid leg and hind tarsus.

Head circular in frontal aspect, strongly arched behind eyes; malar space longer than in female, length at anterior condyle equal to length of antennal pedicel; antennal flagellum rather short and stout and with dense, short, suberect setae, the apical segment 0.8 times as long as preceding three segments combined; third and fourth abdominal sterna with posterior third or half with an arcuate band of dense, appressed setae; fifth and sixth sterna with shorter and more scattered, appressed setae; seventh sternum bare; exserted part of hypopygium narrow and acute, the sides converging toward apex, vestiture similar to that of fifth and sixth sterna.

Euplilis (*Corynopus*) *rufigaster* (*Packard*)

This species was first noted August 22, 1957, nesting in the porch of the cabin at Plummers Island. This fairly populous colony probably had been active for a period prior to the 22nd, for no males were taken between that date and September 20, the latest date on which females were active. Twenty-seven females captured during this period ranged from 4.6 to 6.0 mm. in length. All females captured with prey were carrying paralyzed, adult male and female tendipedid midges, varying in length from 1.5 to 4.0 mm. Provisioning of the nests was taking place as early as 10:30 a.m. and as late as 3:55 p.m.

Eleven midges taken from wasps were identified as follows:

82257 A, ♀ *Tendips* sp., probably *nervosus* (Staeger), 3.1 mm.
82257 B, ♀ of unknown genus and species, 1.8 mm.
82257 C, ♀ *Cricotopus* species, 1.5 mm.
82257 D, ♂ *Tendipes nervosus* (Staeger), 2.8 mm.
83157 A, ♀ of unknown genus and species, 1.7 mm.
9257 B, ♀ ditto, but a different species, 4.0 mm.
9257 D, ♂ ditto, but a different species, 1.9 mm.
9657 A, ♂ *Calopsectra* species, 2.8 mm.
9857 A, ♂ *Procladius culiciformis* (Linnaeus), 3.8 mm.
9857 B, ♀ probably *Calopsectra* species, 1.5 mm.
92057 B, ♀ *Calopsectra* species, 1.8 mm.

When I reached the cabin at 9 a.m., September 20, a female *rufigaster* (92057 A), 5.1 mm. long, was excavating her burrow in an old frass-filled anobiid boring in the porch steps. At that time there was a circle of excavated particles of anobiid frass 5 to 15 mm. distant from the boring entrance. I was absent for the next hour and a half checking some other field work. At 10:32 the wasp flew in with a large pale green midge, holding it beneath her thorax, venter to venter, and head end forward. She left the boring two minutes later and returned with another midge at 10:37. Half a minute later she left the burrow and returned in another half minute with another midge. At this point I split open the boring with a knife and found that the wasp had excavated the anobiid frass from a section about 20 mm. long. The cell contained eleven midges and was not completely stored, for there was no wasp egg or closing partition. The midges ranged from 2.3 to 3.8 mm. in length, and comprised seven males of a species of *Calopsectra*, one female and two males of *Tendipes modestus* (Say), and one male of *Tendipes neomodestus* (Malloch).

Crossocerus (*Blepharipus*) *ambiguus* (*Dahlbom*)

On March 5, 1956, I split a section of board from the cowshed wall in Arlington. There were two cells in one of the abandoned anobiid borings, one of them containing a cocoon with some leafhopper fragments, the other containing adult leafhoppers, thirteen females and one male. The male leafhopper was a specimen of *Empoasca pergandei* Gill. and the females were probably the same species. The leafhopper fragments on the cocoon also appeared to be of this same species. The cocoon was kept in a heated room and on April 12 a male of *C. ambiguus* emerged.

Vol. 71, pp. 27-36 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GECKO OF THE *SPHAERODACTYLUS DECORATUS* GROUP FROM CUBA

By Albert Schwartz
Albright College, Reading, Penna.

The geckonid lizards of the genus *Sphaerodactylus* are represented in Cuba by six forms: *Sphaerodactylus decoratus torrei* Barbour, *S. cinereus* Wagler, *S. notatus* Baird, *S. scaber* Barbour and Ramsden, *S. oliveri* Grant, and *S. argus* Gosse. The name *S. nigropunctatus* Gray has been shown recently by Grant (1957) to be only uncertainly applicable to any Cuban sphaerodactyl. In addition, *S. gibbus* Barbour has been reported; according to Grant (1956, pp. 247-248) the Cuban records of *gibbus* refer to male *S. d. torrei,* and thus *S. gibbus* is not part of the Cuban fauna. Of these lizards, some are known only from rather restricted areas: *oliveri* from the vicinity of Soledad, Las Villas Province, *scaber* from two isolated mountain ranges in Camagüey Province, and *argus* from the vicinity of Soledad, where it may have been introduced from Jamaica. On the other hand, *notatus* is widespread throughout the entire island, *cinereus* occurs from Pinar del Río Province to Camagüey Province, and *torrei* appears to be widespread in Oriente.

During the summer of 1957, herpetological collections were made in the provinces of Pinar del Río, Habana, Las Villas and Camagüey. Sixty-three *Sphaerodactylus* were collected, most of which are the widespread *S. cinereus.* In addition, seven individuals were taken in Habana Province which prove to be an undescribed form of the *S. decoratus* group. Barbour (1921, pp. 227-231) arranged as full species *decoratus, gibbus,* and *torrei;* these three forms are characterized by having granular dorsal scales which are not sharply keeled, these granules becoming anlarged on the flanks. Hecht (1954, p. 133) proposed that *gibbus* and *torrei* be regarded as subspecies of *S. decoratus* Garman (type locality, Rum Cay, Bahamas), so that the subspecies of *S. decoratus,* as presently defined, have the following distribution:

S. d. decoratus Garman—Bahama Islands—known from Rum Cay;

Mangrove Cay, Andros Island; and Andros Island. That it is more widespread than these records indicate is shown by specimens in the American Museum of Natural History and Museum of Zoology, University of Michigan, from the following localities: Bimini, South Bimini, Cat Island, New Providence, Rose Island and Eleuthera, in the Bahamas.

S. d. torrei Barbour—western Cuba (Province of Oriente)—known from the type locality (Santiago de Cuba, Oriente Province), Cabo Cruz, Guantánamo (all from Barbour, *op. cit.*, p. 278); Banes (Grant, *loc. cit.*); Rio Puerco, Boqueron, Puerto Portillo, and Río Yaleritas (Cochran, 1934, p. 12).

S. d. gibbus Barbour—known at present only from the type locality, Stocky Island, Exuma Cays, in the Bahamas. Grant (*loc. cit.*) has documented the erratic history of the recording of this species from Cuba, and, as presently understood, this subspecies does not occur on the large island. Alayo (1955, p. 4) records the taking of a specimen of *S. gibbus* among rocks on the beach at Allende, Matanzas Province. As will be shown below, this specimen is in all probability not *S. gibbus* but rather a representative of the form described herein.

To this complex may well be added in the future *S. stejnegeri* Cochran from Hispaniola (type locality, San Michel, Departement du Nord, Haiti). Barbour (*op. cit.*, p. 230) regarded one specimen from Thomazeau, Haiti, as representing *S. torrei*, and Cochran (1941, pp. 111-12) remarked on the similarity between this species and *S. torrei*. Grant (1949, pp. 74-5) demonstrated that *S. stejnegeri* was sexually dimorphic in pattern, and thus resembles *torrei* and *decoratus*. Six specimens of *S. stejnegeri* from Haiti have been available to me for study; this species is certainly closely related to *S. decoratus*, but I am reluctant to regard them as conspecific at the present time.

I have examined 21 adult specimens of *S. decoratus* from the Exuma Cays, Bahama Islands, B.W.I., recently collected by the Van Voast-American Museum of Natural History Bahama Islands Expedition, as follows (details of these localities may be found in Rabb and Hayden, 1957): Big Farmer's Cay, four males, six females; Warderick Wells Cay, one female; Leaf Cay, one male, one female; Darby Island, two males, six females. The type of *S. gibbus* is undoubtedly a male, although Barbour did not mention this fact. Of the seven males from the Exuma Cays, three agree in pattern with the plate and description of *S. gibbus* given by Barbour (*op. cit.*, p. 229 and pl. 1, fig. 2). The remaining four specimens show gradation from a well spotted dorsum to an unspotted, uniform tan dorsum; this situation is strongly reminiscent of the condition in males of *S. d. torrei* as demonstrated by Grant (1956, *loc. cit.*). Male *S. d. docoratus* do not appear to show the same change in pattern nor the same variation; Barbour had described *S. flavicaudus* on the basis of a male *S. d. decoratus*, and noted (*op. cit.*, pp. 225-6) that males of *decoratus* are pale cream, with the skin showing darker between the scales, giving a reticulate appearance, and having a yellow tail. I have examined four male *S. d. decoratus* (including a paratype of *S. flavicaudus*). Three of these are unicolor; the fourth, the largest of the lot (snout-vent length 32 mm.), has faint indications of transverse banding, typical of females of this subspecies. None has the prominent spotting of male *S. d. gibbus*. After examination of long series of *S. d. decoratus* and *S. d. gibbus*, I am unable to differentiate between the banded females of these two forms. Likewise, there appear to be no constant scale differences, and the acceptance of *S. d. gibbus* seems to rest entirely upon the boldly spotted condition in the males.

On the north coast of Habana Province, with the assistance of Messrs. John R. Feick, William H. Gehrmann, and Sr. Aurelio Sanchez Agramonte, three adult males, two adult females, and two juvenile *Sphaerodactylus* were collected. These specimens, obviously representatives of the *S. decoratus* complex, are strikingly different from *S. d. torrei* from Cuba, as well as from the two Bahaman subspecies. This new subspecies may be known as

Sphaerodactylus decoratus drapetiscus, new subspecies

Type: American Museum of Natural History, No. 77759, an adult female, taken July 15, 1957, two miles east of Playa de Guanabo, Cueva de Rincon de Guanabo, Habana Province, Cuba, by W. H. Gehrmann, Jr., A. Sanchez Agramonte, and A. Schwartz. Original number 2771.

Paratypes: A.M.N.H. Nos. 77760-61; same data as type; A.M.N.H. Nos. 77762-65, same locality as type, but taken August 8, 1957, by J. R. Feick and A. Schwartz; A.N.S.P. No. 16359, Matanzas, Matanzas Province, Cuba, July 28, 1904, by H. A. Pilsbry.

Distribution: Known from the type locality and Matanzas; a specimen of *S. gibbus,* reported by Alayo (*loc. cit.*) from Playa de Allende in Matanzas, probably represents this form, rather than *S. d. gibbus* (which is now assumed not to occur in Cuba), or *S. d. torrei* which, as far as known, occurs only in Oriente.

Diagnosis: A sexually dichromatic *Sphaerodactylus* with granular dorsal scales becoming larger on sides, characterized, in females, by four transverse black bands with light center between the limbs, a black band with a light center on neck anterior to forelimbs, and a single black line just behind ear opening; snout and head longitudinally striped with no black band at level of eyes; in males, dorsum unicolor tan with relatively large, prominent, black spots from level of eyes posteriorly to dorsal three-quarters of dorsum of tail; snout longitudinally striped; juveniles patterned like adult females (see fig. 1).

Description of type: An adult female with the following measurements (all measurements in millimeters): snout-vent length, 31.4; tail absent; distance from snout to center of eye, 4.3; distance from center of eye to tympanic opening, 4.2; width of head, 5.5; dorsal scale rows in snout-eye distance, 19; ventral scale rows in snout-eye distance, 8; fourth toe lamellae, 9 plus terminal enlarged scale; supralabials, 4/4; infralabials, 4/3. Dorsal scales granular, not sharply keeled, enlarging on the sides between the limbs; dorsal surface of head with granular scales of same size as dorsal scales, slightly larger and more flattened on snout; rostral with a median groove, bordered posterior by the two supranasals and a central smaller azygous scale; enlarged supralabials 4/4, the first the longest; mental large, followed by three subequal scales; infralabials 4/3, the first the longest; superciliary spine relatively small, stout, and truncate, especially on left side; ventral scales smooth, large and imbricating on belly, becoming smaller and less imbricating on neck and throat, and gradually grading to non-imbricating granular lateral scales on sides of venter; scales on anterior faces of fore and hind limbs large,

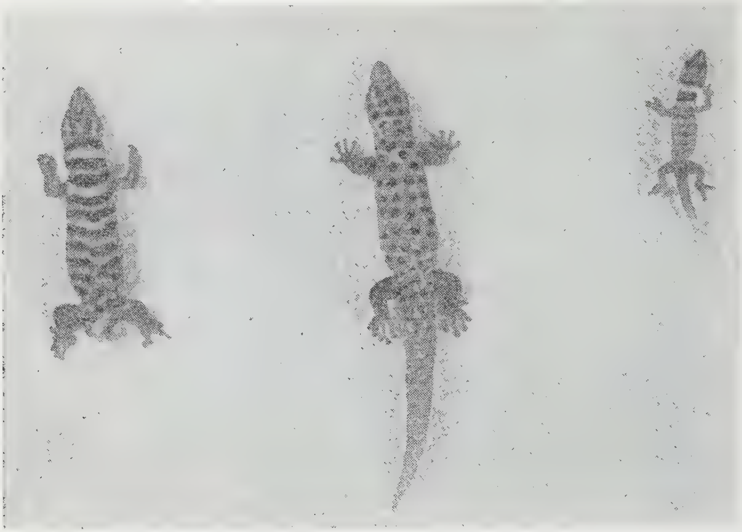


Figure 1. Adults and juvenile of *Sphaerodactylus decoratus drapetiscus.* Left to right; adult female, type (A.M.N.H. No. 77759); adult male, paratype (A.M.N.H. No. 77762); juvenile, paratype (A.M.N.H. No. 77764). Photography by Gary Stone.

smooth, imbricating; scales on posterior surfaces of limbs smaller and granular, comparable to lateral body scales; escutcheon absent.

Coloration of type (based on field notes and Kodachrome photographs): Dorsal ground color yellowish gray, brightest on neck and shoulders; ground color of dorsum of head pale yellowish gray; tail missing. Head with a black band, beginning on sides of neck and passing just posterior to tympanic opening, separated from next black band by a clear yellowish collar. A median black longitudinal stripe, beginning on rostrum, ending on forehead just posterior to orbits, with a central pale yellow enclosed diamond-shaped spot at level of anterior edge of orbits; a second black line, beginning on snout, passing dorsomedially through upper edge of eye and ending just anterior to transverse black band; a third black line on upper labials. Cheek with a gray patch, sending a gray line anteriorly to posterior edge of orbit, bounded ventrally by a yellowish gray band from posterior of eye to ventral side of neck; none of these black or gray head bands confluent with the first transverse black band. A pair of black transverse bands, enclosing a narrow yellowish gray band just anterior to forelimbs, the lighter enclosed band having a few scattered yellow dots just posterior to the anterior of the black bands. Four pairs of bands, black anteriorly grading to gray posteriorly, between limbs, the posterior two pairs incomplete dorsally; the light areas between these bands always with a few scattered yellow dots. Dorsal surface of limbs with yellowish gray ground color, much flecked and mottled with tan, giving a distinct spotted appearance. Venter grayish, with gray flecking on infralabials and on throat. Pre-forelimb black bands continuous almost to ventral midline but not meeting. Scales of ventral surfaces of fore- and hindlimbs with black edges, giving a flecked or ''dirty'' appearance.

Variation: There are two females (A.M.N.H. No. 77763; A.N.S.P. No. 16359) which have the following measurements: snoutvent length, 33.9, 28.8; tail absent or broken on both; distance from snout to center of eye, 4.4, 4.5; distance from center of eye to tympanic opening, 4.0, 3.6; width of head, 5.5, 4.7; dorsal scale rows in snout-eye distance, 18, 17; ventral scale rows in snout-eye distance, 7, 10; fourth toe lamellae, 7, 13, plus terminal enlarged scale; supralabials, 4/4, 4/4; infralabials, 4/3, 4/4. The coloration and pattern of the larger female were much as those described for the holotype, except that both the sides of the body and the dorsal surfaces of the limbs were more yellowish. In all other details these two females agree; there seems to be a somewhat stronger tendency for the two posterior pairs of transverse body bands to be disrupted. Unfortunately, the tails of both fresh females were lost so that no statement of the coloration and pattern of this member can be made. The smaller female paratype, insofar as can be determined because of its time in preservative, possesses the identical pattern of the two fresh specimens. The tail is present but broken, and appears to be indistinctly banded proximally, these bands not extending onto the ventral surface of the tail.

Three of the paratypes (A.M.N.H. Nos 77760, 77762, 77765) are adult males; data on these specimens follow: snout-vent length, 34.9, 31.6, 30.9; length of tail, —, 28.7, 31.0; distance from snout to center of eye, 4.5, 4.1, 4.1; distance from center of eye to tympanic opening, 4.0, 4.0, 4.0; width of head, 6.5, 5.5, 5.5; dorsal scale rows in snout-eye distance, 18, 16, 16; ventral scale rows in snout-eye distance, 8, 10, 8; fourth toe lamellae, 7, 9, 9, all plus enlarged terminal scale; supralabials, 4/4, 4/5, 4/4; infralabials, 4/4, 4/3, 4/3. All the males are heavily spotted with very dark brown above, on a light yellowish tan ground color. The head is distinctly more yellowish than the body, and the ground color of the tail is bright yellow. The head pattern is reminiscent of that of the females; the same longitudinal lines are present, but a bit more obscure, and in the largest male these lines have become obsolete, being reduced rather to a series of dark brown dots. The hindlimbs are pale yellow, and both fore-and hindlimbs are dotted with brown; the dorsal surface of the tail is also spotted with individual brown scales, sometimes arranged in discrete groups, the coloration becoming fainter toward the tip of the tail, which is immaculate yellow. Although not perceptible in life, after preservation there is a faint indication of transverse banding on the dorsa of the two smaller males, corresponding, as nearly as can be determined, to the banding in the females. An escutcheon is present, and restricted to the abdomen anterior to the vent, with no branches extending onto the legs. The ventral scalation of the tail has no transversely elongate median scales, but rather is made up of rounded scales about the size of those covering the belly.

The two juveniles (A.M.N.H. Nos. 77761 and 77764) are very small with snout-vent length of 17.9 and 16.6. The pattern is an intensification of that described for adult females, and is exactly similar except for the absence of yellow dots within the light areas. The ground color of the juveniles is pale yellowish gray dorsally, with the head dull yellow, somewhat lighter on the snout. The light interbands on the dorsum are much grayer than in the adult females, and thus the four pairs of black transverse bands between the limbs are more pronounced. The tail is vivid yellow with a completely white tip; one juvenile shows a faint indication of three transverse gray bands on the proximal half of the dorsum of the tail. The belly is grayish, and the first yellow transverse band behind the tympanic openings continues ventrally as a yellow collar onto the neck.

Comparisons: *S. d. drapetiscus* requires comparison principally with *S. d. torrei* from western Cuba. The females of the two subspecies are readily separable on the basis of pattern. *S. d. torrei* typically has two or three wide transverse black bands on the dorsum between the legs; with increasing size of the lizard, these bands become lighter centrally, forming two or three pairs of transverse bands. *S. d. drapetiscus* has four pairs of transverse dark bands between the limbs. Even more striking is the head pattern. All females of *torrei* have a black band immediately posterior to the eyes, and this band is joined to the longitudinal lines on the head and snout; such a postocular black band is absent in *drapeticsus.* There is likewise a black band, in larger individuals lighter centrally, in the center of which lies the tympanic opening. This condition in *torrei* differs from that of *drapetiscus,* where this wide tympanic band is absent, being replaced rather by a narrow band lying just posterior to the ear opening. The postocular, tympanic, and pre-forelimb bands of *torrei* continue ventrally onto the throat and neck as well defined units, whereas the neck and throat of *drapetiscus* are devoid of such continuations of the dorsal bands. These comments on females of the two races are equally applicable to the juveniles, which possess the adult female pattern.

I have examined five adult male *Sphaerodactylus* which, on the basis of scalation, I refer unquestionably to *S. d. torrei;* these are U.S.N.M. No. 81727 (Puerto Portillo, Oriente); A.M.N.H. Nos. 61604-05 (Marcane, Oriente); U.M.M.Z. No. 90725 (La Socapa, Santiago de Cuba, Oriente); and U.M.M.Z. No. 90726 (Castillo del Morro, Santiago de Cuba, Oriente). There are other specimens from Oriente in these collections which are identified as *torrei,* but for various reasons I doubt that they are correctly assigned to this form. Of the five males under consideration here, four resemble males of *S. d. drapetiscus,* except that No. 81827 is more densely spotted than its fellows or the extant male *drapetiscus.* The fifth male (No. 90725) has the head densely spotted, but the dorsum of the body is completely unicolor. All differ from male *drapetiscus* in having the throat heavily punctate with discrete brown spots. Grant's (1956, p. 247) plate of 12 male *torrei* shows a ventral view of one individual; this specimen appears to lack throat spots; it is possible that throughout the range of *S. d. torrei* this character is not constant. The nine females likewise figured in this plate show very well the pattern variations typical of their sex.

From the two Bahaman subspecies, *S. d. drapetiscus* females differ strikingly. Females of both *decoratus* and *gibbus* are characterized by having four pairs of transverse bands between the limbs, and in this character resemble the new Cuban subspecies. But both demonstrate postocular and tympanic transverse bars as well, and in this character resemble *torrei* rather than *drapetiscus.* The pre-forelimb band in both *decoratus* and *gibbus* typically has also a pair of light ocelli in its center; so far as known, this does not occur in *drapetiscus.*

I have examined seven male *S. d. gibbus* (A.M.N.H. No. 76240, from Leaf Cay, Exuma Cays; four A.M.N.H. untagged specimens (field nos. 1254-57) from Big Farmer's Cay, Exuma Cays; U.M.M.Z. No. 117017 and one untagged specimen (field no. 1284) from Darby Island, Exuma Cays). The Big Farmer's Cay specimens show the transition from an almost unicolor dorsal pattern with a very few, widely scattered dorsal brown dots, to one individual which is typical of the race *gibbus* as described by Barbour (*op. cit.,* pp. 228-9), displaying course large brown dots over the dorsum. The single individual from Leaf Cay is darker in preservative than the Big Farmer's specimen, and is entirely dark tan dorsally, without any indication of dorsal spotting. The two specimens from Darby Island are heavily spotted. As noted previously, no male *S. d. decoratus* show the bold dots of *gibbus.*

If *S. stejnegeri* is regarded in the future as a subspecies of *S. decoratus,* females of this species and *S. d. drapetiscus* are readily separable on the basis of the former having but two transverse dark bars, rather than four as in drapetiscus, and the patterns of the two are thus quite distinct. However, *stejnegeri* has the single posttympanic dark transverse bar which is typical of *drapetiscus,* and lacks the postocular bar of *decoratus, gibbus,* and *torrei.* Males of *S. stejnegeri* are apparently unicolor light to medium brown (Grant, 1949, p. 74).

Three specimens (U.M.M.Z. Nos. 117019 and one untagged specimen; U.M.M.Z. No. 117020) from Long Island in the Bahamas deserve special mention. Long Island lies off the eastern end of the Exuma Cays, between Exuma, and North and Fish Cays. I have seen no *Sphaerodactylus* from the latter localities (which I presume are inhabited by *S. d. decoratus*) nor from Exuma itself (which I presume to be inhabited by *S. d. gibbus*). The three Long Island individuals are one female and two males; the female resembles closely occasional females of *decoratus* (i.e., U.M.M.Z. No. 79444 from Cat Island) in having the dark edges of the transverse bands much fragmented. A poorly defined ocellus is present on the left side. The two males are banded, the smaller (snout-vent length 26.8 mm.) distinctly so, the larger (snout-vent length 30.8) indistinctly, with a strong tendency for the edges of the transverse bands to form large dark spots over the entire dorsum except on the snout. Neither male is unicolor (as are males of *decoratus*) and they more closely resemble male *gibbus* except that no other male *gibbus* examined shows the presence of transverse banding. I cannot allocate these specimens with any security; the spotted male is smaller than the large male *decoratus* (U.M.M.Z. No. 79444), which shows faint traces of transverse banding and no spotting, from Cat Island. It seems preferable at this time, pending the collection of more sphaerodactyls from the Bahaman area, to hold the subspecific determination of the Long Island populations in abeyance.

In summary, the females of the four races of *S. decoratus* show varying degrees of differentiation. The races *torrei* and *drapetiscus* are easily distinguished from each other, and from *decoratus* and *gibbus* treated together. Female *decoratus* and *gibbus* appear to me to be indistinguishable from each other on the basis of pattern. The females of these four races are all readily distinguishable from female *S. stejnegeri* from

Hispaniola. Males of *torrei, drapetiscus,* and *gibbus* are all strikingly alike, except that male *torrei* may have a heavily punctate throat, and even this character is open to doubt. Male *decoratus* are poorly known, but are usually considered unicolor (or possibly faintly banded), as are males of *S. stejnegeri;* if this is true, males of these two forms can be distinguished from adult males of the three heavily spotted forms.

Scale characters (see Table 1) of the four races of *S. decoratus* show that *drapetiscus* differs from the remaining three subspecies in average lower number of dorsal and ventral scales in the snout-eye distance, as well as a lower average number of fourth toe lamellae. Differences between *torrei, gibbus,* and *decoratus* are not striking; the two Bahaman forms average less ventral scales than the Cuban *torrei,* but the difference is likewise not trenchant.

Remarks: The type locality of *S. d. drapetiscus* is an exposed limestone outcropping along the north coast of Habana Province. The cliff is penetrated by one large and two smaller caves, all locally known as the Cueva de Rincon de Guanabo; however, none of the geckoes was taken within the caves. All were found under rocks on the ground at the base of the cliffs, and in cavities on the cliff face itself. The lizards were extremely agile, seeking escape by running into the many solution holes in the fallen pieces of rock, which were often sponge-like in appearance, and offered an excellent asylum for the lizards. At least three other individuals were seen at the type locality, but all escaped in rocky piles or holes in the fallen rocks. The cliff area is readily visible from the La Habana-Matanzas superhighway which is presently under construction; the vegetational cover is typical tropical deciduous woods with scattered palms. The Matanzas specimen is recorded as having been taken ''under a rock.''

Alayo's (*loc. cit.*) record of *S. gibbus* from Matanzas should almost certainly be referred to *drapetiscus.* This specimen probably represents a male of the latter race, since the males of *gibbus* and *drapetiscus* are very similar; likewise, there is no evidence that *gibbus* occurs in Cuba, and the Matanzas specimen would thus be assignable either to *drapetiscus* or *torrei.* Since *torrei* is at present unknown from the provinces of Camagüey and Las Villas, provinces which lie between Oriente and Matanzas, it is much more probable that the Matanzas specimen is referrable to *drapetiscus* than to *torrei.* The paratype from Matanzas tends to confirm this supposition.

I have had the opportunity to examine material for comparison of the races of *S. decoratus* from several collections. For their courtesies in allowing me to borrow specimens for the present study, I wish to thank

Table 1. Scale counts (means and extremes) of four races of *Sphaerodactylus decoratus*

	Number and sex	*Dorsal scales*	*Fourth-toe lamellae*	*Ventral scales*
torrei	3♂, 7♀	21.4 (17-26)	12.1 (9-15)	11.6 (8.15)
drapetiscus	3♂, 3♀	17.3 (16-19)	9.0 (7-13)	8.5 (7-10)
gibbus	5♂, 8♀	19.7 (16-26)	11.8 (9-13)	9.4 (7-11)
decoratus	1♂, 5♀	21.7 (15-29)	11.2 (8-14)	9.6 (8-12)

the following: Dr. Doris M. Cochran, United States National Museum (U.S.N.M.); Dr. Norman E. Hartweg and Mr. Richard Etheridge, Museum of Zoology, University of Michigan (U.M.M.Z.); Dr. Richard G. Zweifel and Mr. Charles M. Bogert, American Museum of Natural History (A.M.N.H.); Dr. James Boehlke, Academy of Natural Science of Philadelphia (A.N.S.P.).

Specimens examined: *S. d. decoratus: Bahamas, B.W.I.,* Bimini, 5 (A.M.N.H. Nos. 73489, 73493-96); South Bimini, 7 (A.M.N.H. Nos. 75873, 68806 (2), 68807 (2), 68808 (2)); Hatchet Bay, Eleuthera, 3 (A.M.N.H. Nos. 69245-46, 69249); Mangrove Cay, Andros Island, 5 (A.M.N.H. No. 24715; U.S.N.M. No. 62344; U.M.M.Z. Nos. 107614; 117022 (2)); Andros Island, Driggs Hill Shore, 2 (U.M.M.Z. No. 117023 (2)); Rose Island, near New Providence, 1 (U.M.M.Z. No. 117021); Nassau, New Providence, 1 (U.M.M.Z. No. 100741); Cat Island, Orange Creek, 1.5 miles northwest Arthurs Town, 9 (U.M.M.Z. Nos. 79444 (5), 79445 (4)).

S. d. gibbus: Bahamas, B. W. I., Big Farmer's Cay, Exuma Cays, 13 (A.M.N.H. Nos. 76232-36, plus eight untagged specimens); Leaf Cay, Exuma Cays, 6 (A.M.N.H. Nos. 76238-43); Warderick Wells Cay, Exuma Cays, 1 (A.M.N.H. No. 76237); Darby Island, Exuma Cays, 8 (U.M.M.Z. Nos. 117017, 117018 (7)).

S. d. torrei: Cuba, Oriente Province, Marcane, 7 (A.M.N.H. Nos. 61604-10); Belig, near Manzanillo, 1 (A.M.N.H. No. 32301); Santiago de Cuba, 11 (A.M.N.H. Nos. 42546, 42583-90; U.M.M.Z. Nos. 90725-26); Boqueron, 1 (U.S.N.M. No. 81822); Puerto Portillo, 2 (U.S.N.M. Nos. 81827-28).

S. d. drapetiscus: Cuba, Habana Province, two miles east of Playa de Guanabo, Cueva de Rincon de Guanabo, 7 (A.M.N.H. Nos. 77759-65, type and paratypes); Matanzas Province, Matanzas, 1 (A.N.S.P. 16359, paratype).

S. decoratus incertae sedis: Bahamas, B. W. I., Long Island Clarence Town, 2 (U.M.M.Z. No. 117019); Long Island, Deadman's Settlement, 1 (U.M.M.Z. No. 117020).

LITERATURE CITED

Alayo Dalmau, Pastor. 1955. Lista de los reptiles de Cuba. Universidad de Oriente, Museo ''Charles T. Ramsden,'' mimeographed, pp. 1-29, 7 plates.

Barbour, Thomas. 1921. Sphaerodactylus. Mem. Mus. Comp. Zool., vol. 47, no. 3, pp. 217-278, 26 plates.

Cochran, Doris M. 1934. Herpetological collections from the West Indies made by Dr. Paul Bartsch under the Walter Rathbone Scholarship, 1928-1930. Smithson. Misc. Coll., vol. 92, no. 7, pp. 1-48.

———— 1941. The herpetology of Hispaniola. Bull. U.S. Nat. Mus., No. 177, pp. i-vii, 1-398, 20 figures, 12 plates.

Grant, Chapman. 1949. Sexual dichromatism is *Sphaerodactylus stejnegeri.* Copeia, no. 1, pp. 74-5, 1 plate.

———— 1956. The status of *Sphaerodactylus gibbus.* Herpetologica, vol. 12, no. 3, pp. 247-8, 1 plate.

——— 1957. The status of *Sphaerodactylus nigropunctatus,* a neotropical gecko. Nat. Hist. Misc., no. 158, pp. 1-4.

Hecht, Max K. 1954. The comparison of recent and fossil amphibian, reptilian, and mammalian faunas in the Bahamas. Year Book Amer. Phil. Soc., pp. 133-5.

Rabb, George B., and Ellis B. Hayden, Jr. 1957. The Van Voast-American Museum of Natural History Bahama Islands Expedition. Record of the expedition and general features of the islands. Amer. Mus. Novit., no. 1836, pp. 1-53, 15 figures.

Vol. 71, pp. 37-42 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ANOTHER NEW LARGE *ELEUTHERODACTYLUS* (AMPHIBIA: LEPTODACTYLIDAE) FROM WESTERN CUBA

By Albert Schwartz
Dept. of Biology, Albright College, Reading, Pennsylvania

During the Christmas holiday season of 1956, a small obviously immature *Eleutherodactylus* was collected by Messrs. John R. Feick, William H. Gehrmann, Jr., and the writer at San Vicente, Pinar del Río Province, Cuba. Other leptodactylid material in the same collection has been reported upon (Schwartz, 1958). During the summer of 1957, under a National Science Foundation grant, three weeks were spent at San Vicente, in the hope that additional and adult specimens of this frog might be obtained. Such was indeed the case; on the night of June 18, a large gravid adult female was taken by Mr. Feick and during the following weeks, additional adult and subadult specimens were collected. There are thus at hand 11 specimens of this remarkable new species.

I wish to thank Mr. Dennis R. Paulson, as well as Messrs. Feick and Gehrmann for their assistance in the pursuit of amphibians in the San Vicente region. Without their cordial assistance, such a series of the new form would certainly not have been taken. Dr. Richard G. Zweifel of the American Museum of Natural History has offered me advice from his knowledge of Central American eleutherodactyli, and I am grateful to him for this assistance.

The Cuban *Eleutherodactylus* have been summarized by myself (*op. cit.*); since the time of my summary, a new species, *E. symingtoni*, has also been described from Pinar del Río Province. The Cuban leptodactylids are presently separated into five groups, each with its own combination of characteristics; these groups are the *auriculatus, varleyi, ricordi,* and *dimidiatus* (all *sensu* Dunn, 1926, p. 210), and the *symingtoni* group (Schwartz, 1957). The new large species is not assignable with certainty to any of the five existing species groups. Its affinities are close to the *auriculatus* group, but it differs from that assemblage of five species (*auriculatus, sonans, eileenae, varians, gehrmanni*) by absence of a rugose belly. It may be placed with equal propriety in the *symingtoni* group, although the new species has enlarged digital discs and *symingtoni* lacks them. Insofar as known, all members of the *auriculatus* group are arboreal, and all have enlarged digital discs; although the new species possesses very large digital discs, it is not known to be a tree climber, and is, on the other hand, petricolous and clivicolous in its activities. The new species may be called

Eleutherodactylus zeus, new species

Figure 1

Type: American Museum of Natural History (A.M.N.H.) No. 60791, taken 0.5 miles south of San Vicente, Pinar del Río Province, Cuba, by John R. Feick, on June 18, 1957. Original number 1627.

Paratypes: A.M.N.H. No. 60792, same data as type, A. Schwartz; A.M.N.H. No. 60793, cliffs at Cueva del Río, San Vicente, Pinar del Río Province, J. R. Feick, June 20, 1957; A.M.N.H. Nos. 60794-96, cliffs at Cueva del Río, San Vicente, Pinar del Río Province, J. R. Feick, W. H. Gehrmann, A. Schwartz, June 23, 1957; A.M.N.H. No. 60797, cliffs at Cueva del Río, Pinar del Río Province, D. R. Paulson, June 26, 1957; A.M.N.H. No. 60798, cliffs at Cueva del Río, San Vicente, Pinar del Río Province, J. R. Feick, July 1, 1957; A.M.N.H. Nos. 60799-800, cliffs at San Vicente, Pinar del Río Province, J. R. Feick, W. H. Gehrmann, July 7, 1957; A.M.N.H. No. 59829, San Vicente, Pinar del Río Province, J. R. Feick, W. H. Gehrmann, A. Schwartz, December 21, 1956.

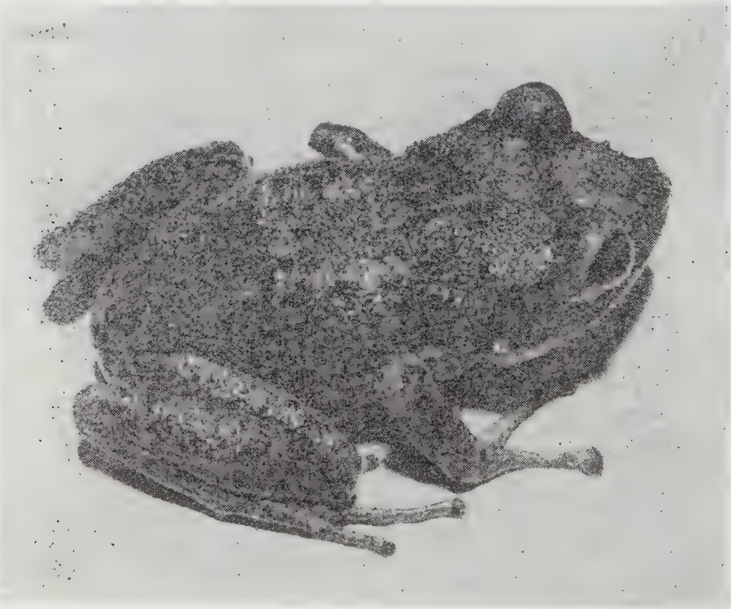


Figure 1. *Eleutherodactylus zeus*, adult female, paratype, A.M.N.H. No. 60792, snout-vent length 79.8 mm. taken in life by William H. Gehrmann, Jr.; specimen from 0.5 miles south of San Vicente, Pinar del Río Province, Cuba.

Distribution: Known only from the type locality and its environs, in the vicinity of San Vicente, Pinar del Río Province, Cuba.

Diagnosis: An *Eleutherodactylus* characterized by very large size, greatly enlarged digital discs, smooth belly, finely rugose or shagreened dorsum, two enlarged canthal tubercles, short vomerine tooth series, and olive green to brown dorsum with a pair of pale yellow postscapular spots.

Description of type: An adult female, with the following measurements (all measurements in millimeters): snout-vent length, 83.0; head length (snout to posterior border of tympanum), 34.2; greatest width of head, 36.7; longitudinal diameter of eye, 8.9; longitudinal diameter of tympanum, 5.9; naris to anterior corner of eye, 11.7; femur, 40.2; tibia, 42.0; length of fourth toe, 37.7. Head slightly broader than distance from snout to posterior border of tympanum; snout decidedly truncate, with nares prominent at anterior end of canthus rostralis; canthus rostralis with two large, and one to three smaller, pronounced pointed canthal tubercles; diameter of eye somewhat less than distance from naris to anterior corner of eye; interorbital space 11.7, greater than diameter of eye; diameter of tympanum much less than diameter of eye, distance from tympanum to eye about equal to diameter of tympanum; tympanum oval, its vertical diameter greater (7.9) than its horizontal (5.9). Digital discs present, large, that on fourth toe largest, equal to about one half size of tympanum. Fingers extremely long and slender, unwebbed, 3-4-2-1 in order of decreasing length; subarticular tubercles well developed. Toes long and slender, unwebbed, 4-3-5-2-1 in order of decreasing length. Heels barely touch when legs are held with femora at right angles to body axis. Dorsum extremely and minutely rugose, rugosities extending from snout over lores, dorsal surface of head and body, thigh, crus, and hindfoot, those on head and in area of eyes somewhat larger and more prominent; a raised fine median middorsal line. Dorsal tuberles small and evenly spaced, with those on canthal line especially large and prominent; general aspect of dorsum a finely shagreened appearance; upper eyelids minutely tuberculate. Throat smooth; venter smooth with belly disc feebly developed. Posterior and ventral surfaces of thighs covered with large, flattened, indistinct pavement-like granules. Tongue oval, free behind, its greatest width about half of that of floor of mouth. Vomerine teeth in two short, stout, slightly curved series, that on the right side much shorter than that on left; vomerine teeth extending medially from just within the level of the interior edge of the choanae, and widely separated from each other by a distance equal to that of the larger left series, and separated from choanae by a distance equal to about half the length of the larger series.

Coloration of type (based on color notes taken in the field and on Kodachrome photographs): Dorsum olive green (Pl. 16, H10; color designations from Maerz and Paul, 1950), more brown than green, and faintly mottled with black; snout darker brown; poorly defined black interocular bar; a postscapular faintly yellowish spot on each side; tips of dorsal rugosities greenish or yellowish, giving a somewhat speckled and mottled appearance; arms and thighs with lichenous grayish markings; concealed surfaces of thighs dull brownish purple; dorsum of thighs mottled brown; digits pale dusky green; venter dusky, especially on throat, which possesses a raised median midventral line from mandibular symphysis to pectoral girdle; all subarticular tubercles gray.

Variation: Of the series of paratypes, there are three adult females, two adult males, one subadult female, three subadult males, and one juvenile (snout-vent length, 15.9). The adult males (A.M.N.H. Nos. 60794, 60798) have the following measurements: snout-vent length, 63.7, 62.4; head length, 25.9, 25.2; greatest width of head, 25.5, 24.5; diameter of eye, 7.9, 7.6; diameter of tympanum, 5.5, 4.8; naris to eye, 9.3, 8.2; femur, 28.2, 28.2; tibia, 30.2, 27.9; length of fourth toe, 26.7; 26.9. The three adult females (A.M.N.H. Nos. 60792, 60796-97) are all somewhat smaller in snout-vent length than the type, but numbers 60792 and 60796 are both gravid, and thus can be considered fully adult. The measurements on these three specimens are: snout-vent length, 79.8, 74.3, 69.2; head length, 31.4, 30.3, 28.1; greatest width of head, 33.0, 31.3, 28.3; diameter of eye, 8.2, 8.3, 7.3; diameter of tympanum, 5.1, 5.4, 5.0; naris to eye, 10.5, 10.5, 9.6; femur, 33.5, 35.0, 33.6; tibia, 36.0, 36.0, 35.1; length of fourth toe, 32.7, 31.5, 32.0. The subadult specimens of both sexes range in snout-vent length between 37.4 and 47.0. I can determine no sexual dimorphism in this lot of specimens, other than the smaller adult size of the males. The tympana do not appear to be smaller in either sex, and both sexes are colored alike.

The coloration of *E. zeus* is remarkably constant for an *Eleutherodactylus.* All were colored olive brown in life with a mottled black dorsum. Although not specifically noted on the type, the upper eyelids of most specimens were recorded as being clear green (Pl. 16, L3 in number 60793). The postscapular spots are yellowish, varying from a very pale yellow to a more intense pigment, but never bright. In one adult female (A.M.N.H. No. 60797), the pale yellow postscapular spots were more extensive and pale yellow dorsolateral fields were apparent, but obscure. This female also has a more definite interocular bar and a dusky V on the snout, the apex of the V almost merging with the interocular bar. Ventrally, both adult males and females have a brownish throat, and a lighter dusky brownish smooth belly.

The subadults are colored much as the adults, except that there is a rather well defined dark brown interbrachial bar, and the remainder of the dorsum appears more heavily mottled with black or brown. The crus is occasionally transversely banded with dull brown, the bands separated by faint whitish rows of dots. The juvenile individual has a dark brown interocular bar and a dark brown interbrachial bar, outlined anteriorly with dirty white; the crus is prominently transversely banded with three or four light tan bands separated by fine white lines.

Structurally, the paratypes agree closely with the type. The vomerine series is always short and stout, and the digital discs are always large. The dorsum is shagreened and there are two canthal tubercles in all specimens except the juvenile, which lacks them and also has an almost smooth dorsum. The canthal tubercles are better developed in adults, but are nonetheless indicated in subadult specimens.

Comparisons: E. zeus requires comparison with no other Cuban *Eleutherodactylus* by virtue of its very distinctive combination of canthal spines, large size, and very large digital discs. The only other Cuban leptodactylids which are large (yet, so far as known, do not reach the maximum known size of *zeus*) are *E. greyi* Dunn and *E. symingtoni* Schwartz. Of these, the former is not known from Pinar del Río Province; it also is a member of the *ricordi* group, and thus has the digital discs feebly developed or restricted to the outer two fingers, and a long vomerine series. *E. symingtoni,* on the other hand, is known only from one specimen from Pinar del Río Province; although this specimen is close to the size of *zeus, symingtoni* differs in having a very rugose, rough dorsum, orange vermiculations on the hindlimbs, absence of digital discs, and dark brown venter. Both resemble each other in large size and presence of canthal tubercles, although these are much more prominent in *zeus* than in *symingtoni.* In the latter species, the canthal tubercles are not only less strikingly developed, but are more or less obscured by the heavily rugose dorsum.

Remarks: E. zeus is typically a petricolous or clivicolous species. Only one specimen was taken on soil, the remainder being collected from rocks or cliffs, and, in one instance, from a fallen decaying log in deciduous woods. The combination of rocky or cliffy areas with dense deciduous growth is the precise niche which this frog inhabits, and the *mogote* section of Pinar del Río is typified by this association. The mottled coloration blends well with the irregular rocky surfaces which *zeus* inhabits. The Sierra de los Organos, in which mountain range *zeus* is found, is the area with the highest rainfall in Cuba. Conditions are always very mesic, and the humidity at night is consistently high. Even after a dry day, which is unusual in summer in these mountains, the leaf litter and rocks are extremely moist, and, in sheltered areas and solution holes in the limestone, small quantities of rainwater persist from the last rain. No specimens of *E. zeus* were collected during the day, despite persistent overturning of logs and limestone chunks; I suspect that the diurnal retreat of these frogs is in the deep crevices in the high cliffs of the *mogotes* in this region. In affirmation of this postulation, one individual was collected in a narrow but deep crevice on the cliff face at night; in the same crevice was a large roach (*Eurycotis*). *Eleutherodactylus zeus* feeds upon these large roaches; the type specimen disgorged a recently taken roach when it was collected. Although there are no evidences of predation upon *zeus*, the cliffs are inhabited by a large tarantula and by the arachnid *Phrynus,* and almost certainly these arthropods capture and eat the frogs. At Soroa, in Pinar del Río Province and in the Sierra de los Organos, I witnessed the capture of a small *Eleutherodactylus* by *Phrynus,* and this lends credence to the supposition that this arachnid feeds at least in part on frogs which inhabit cliffs along with it.

In disposition, *E. zeus* is lethargic, and allows the collector's approach without alarm. Once disturbed, it shows itself to be a powerful jumper, and invariably escapes capture by leaping away among the rocks which it inhabits. One specimen, when disturbed, escaped by ascending a vertical cliff face with ease.

The assignment of *E. zeus* to one of the five recognized groups of Cuban eleutherodactyli is difficult. It appears to be related to the *auriculatus* group in possessing all the features of that assemblage of species except a rugose belly. On the other hand, it resembles the *symingtoni* group in all characteristics except that *zeus* possesses digital discs which are absent in *symingtoni. E. zeus* thus seems to bridge the gap between the *auriculatus* and *symingtoni* groups, and its precise affinities are problematical. I regard it however as being closer to the latter than to the former; both *zeus* and *symingtoni* are large frogs with short vomerine series, canthal tubercles, shagreened or heavily rugose dorsa, smooth bellies, and mottled dorsal coloration. They differ in degree of development of the canthal spines, color of concealed surfaces of thighs, presence of digital discs in *zeus,* and degree of development of dorsal rugosities. Of these differences, only the digital discs present a serious problem, and for the moment it seems satisfactory to regard *zeus* as a specialized climbing derivative of the same stock to which *symingtoni* is also related. Thus, I regard *zeus* as a member of *symingtoni* group.

The degree of endemism in amphibians and reptiles in the Sierra de los Organos is interesting. Aside from these two strikingly different species of *Eleutherodactylus,* the montane areas of Pinar del Río are inhibited by other endemic species; among them may be mentioned the lizards *Deiroptyx vermiculatus* and *D. bartschi,* and the snake *Tropidophis feicki.* The distribution of *Cadea blanoides* and *Eleutherodactylus gehrmanni* are poorly known, but the former appears to have had the western mountain mass as a center of dispersal, and the latter is probably restricted to the montane areas of Pinar del Río Province.

LITERATURE CITED

Dunn, Emmett R. 1926. Additional frogs from Cuba. Occ. Papers Boston Soc. Nat. Hist., vol. 5, pp. 209-215.

Maerz, A., and M. Rea Paul. 1950. A dictionary of color. New York, McGraw-Hill Book Co., pp. v-vii, 1-208, 56 pls.

Schwartz, Albert. 1957. A new species of *Eleutherodactylus* (Amphibia: Leptodactylidae) from Cuba. Proc. Biol. Soc. Wash., vol. 70, pp. 209-212.

——————— 1958. Four new frogs of the genus *Eleutherodactylus* Leptodactylidae) from Cuba. Amer. Mus. Novitates, in press.

Vol. 71, pp. 43-44 April 11, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

APHTHARGELIA NOM. NOV. FOR *THARGELIA* OESTLUND (APHIDAE)

F. C. HOTTES

The new name proposed herewith is made necessary because the name *Thargelia* erected for a genus is the family Aphidae by Oestlund is a homonym.

In 1922 Oestland proposed the name *Thargelia* for a new genus in the family Aphidae, not knowing that Puengeler had made use of this name for a genus of Lepidoptera in 1899. I have known of the homonymy of *Thargelia* for many years, and was reminded of this fact recently, when D. Hille Ris Lambers, in a publication by G. F. Knowlton made use of it. The genus *Thargelia* of Oestlund has been little used in America, but its type species has been placed in a number of genera. It is suspected that it will come into general use when the system of classification used in Europe comes into more general use.

I propose the name **Aphthargelia** nom. nov. for the *Thargelia* of Oestland and select as type (monohypical) *Aphis symphoricarpi* Thomas. Oestlund's type for the genus *Thargelia* was his species *Aphis albipes* which Hottes and Frison have shown to be a synonym of the species described by Thomas as *Aphis symphoricarpi.*

Vol. 71, pp. 43-48 May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NORTH AMERICAN HARPACTICOID COPEPODS
4. DIAGNOSES OF NEW SPECIES OF FRESH-WATER CANTHOCAMPTIDAE AND CLETODIDAE (GENUS *HUNTEMANNIA*)

Mildred Stratton Wilson
Arctic Health Research Center, U. S. Public Health Service, Anchorage, Alaska

Diagnoses of new species are presented here so that they may be included in the key to the Harpacticoida in the forthcoming revised edition of Ward and Whipple's Fresh-water Biology. All types are deposited in the United States National Museum.

Grateful acknowledgment is expressed to the various persons who have kindly made collections for me.

FAMILY CANTHOCAMPTIDAE

Canthocamptus robertcokeri, new species

Canthocamptus staphylinoides Pearse, Davis 1954: 398, Table 3.
Canthocamptus sinuus Coker, McKee and Coker 1940: 179, 185.

Specimens examined: Lake Erie, off Cleveland, Ohio, C. C. Davis, collector: *Type lot*, 51 ♀, 5 ♂, surface tow, Nov. 8, 1956. 3 ♀, 12 M depth, same date. 4 ♀, 1 ♂, May 26, 1951 (published as *C. staphylinoides*, Davis 1954).

North Carolina: 1 ♀, Garner's Lake No. 2, Carteret Co., Jan. 15, 1938, P. McKee, collector (published as *C. sinuus*, McKee and Coker 1940).

Louisiana: 1 ♂, seasonal ditch pond, south of Lebeau, St. Landry Par., Dec. 27, 1951, W. G. Moore, collector. Natchitoches Par., J. E. Sublette, collector: 4 ♀, 3 ♂, ditch pond, 4 miles w. of Natchitoches, Apr. 15, 1956; 2 ♀, swamp pond, 3.7 miles w. of Mora, Mar. 28, 1956; 2 ♀ borrow pit, Red Dirt Game Preserve, Mar. 31, 1956, occurring with *C. assimilis* Kiefer.

Utah: 3 ♀, 1 ♂, Bear Lake, Oct., 1956 and July, 1957, W. J. Clark, collector.

Diagnosis: Distal membrane of body segments coarsely serrate to smooth. Anal operculum with 7-9 stout spinules. Caudal ramus of both sexes elongate and narrow, length 4-5 times its own greatest width and about 2 times that of the anal segment (outer margin); with narrow sclerotized ridge on dorsal face; without or with a few spinules on inner margin. Outer caudal seta extremely slender, subequal to or a little longer than ramus, jointed near base; middle seta very stout, unjointed, about 5 times length of outer seta. Leg 2 of both sexes with 1 inner seta on distal segment or portion of endopod. Leg 4 of female with middle apical seta of endopod slender but longer than outer spine. Leg 3 of male with 2 well developed setae on apex of endopod, the outer about twice the length of endopod. Leg 5 of female with prominent production of mid portion of basal expansion, and gap between setae 3 and 4. Leg 5 of male, exopod segment with 5 setae. Spermatophore flask-shaped. Total body length: ♀ 0.65-0.78 mm. ♂ 0.54-0.62 mm.

Remarks: Specimens from Lake Erie, North Carolina and a part of those from Louisiana, have extremely coarse serrations of the distal membrane of the body segments, but some of those from Louisiana and the specimens from Utah have smooth membranes. The presence or absence of spinules on the inner margin of the caudal ramus was not correlated with that of the serrations. All of the males examined had only five setae on the exopod of leg 5, lacking the usual seta at the inner base of the segment. This character, combined with those of the caudal ramus and its setae, and the setation of leg 2, distinguish this from other North American species of *Canthocamptus.*

Attheyella alaskaensis, new species

Type lot: 2 ♀, margin of Lake Tikchik, Bristol Bay region of southwestern Alaska (about lat. 60°N., long. 159°W.), Aug. 18, 1954, O. A. Mathisen, collector.

Diagnosis: Subgenus *Attheyella;* allied to *A. idahoensis* (Marsh). Body segments coarsely serrate distally. Genital segment divided at middle by complete, heavy sclerotization produced laterally into stout spinous processes like those of segmental divisions. Anal operculum unarmed. Caudal ramus, length greater than anal segment (36:26) and more than twice its own greatest width (36:14); somewhat flattened and broad throughout, the distal part hardly constricted, with rounded apex; heavy sclerotized ridge running nearly entire length of mid dorsal face; distal groups of spinulose hairs on both ventral and dorsal faces; outer marginal setae placed below middle of ramus, not longer than width of ramus; only middle caudal seta well developed and longer than ramus (about 60:36), swollen at base, unjointed, with fine marginal spinules; outer seta about one-third length of ramus, swollen at base and densely plumose. Antennule 7-segmented, the usual apical segment fused with 7. Leg 1 with 3-segmented endopod, first segment reaching to about middle of exopod segment 3. Legs 2-4: exopod segment 3 with 3 outer spines, the total number of spines and setae: 6,7,6; endopods 2-segmented, first segment of legs 2-3 with inner seta, apical segment with total number of setae: 3,4,3. Leg 5 like that of *A. idahoensis*; exopod elongate, its length about 5.5 times its greatest width; basal expansion prolonged into similar narrow portion that reaches to near the end of the exopod; both armed with 6 short setae, ranging in length from less than to a little more than width of segment. Total body length about 1.0 mm.

Remarks: Although only two specimens of one sex are available, there is no question about the specific status of this copepod. The fifth leg cannot be distinguished from that of *A. idahoensis*, but the two species have strikingly different caudal rami. Coker (1934) has clarified some of the confusion in Marsh's (1903) description of *idahoensis*, but comparison with Alaskan specimens indicate that the type form of the species is still inadequately defined as regards the spinal formula of legs 2-4. *A. idahoensis* has been collected in Alaska near Anchorage, from moss on a roadside cliff over which a melt water stream from the Chugach Mountains was flowing.

Bryocamptus washingtonensis, new species

Specimens examined: *Type lot*, 13 ♀ (7 ovigerous), 2 ♂, pond, 1 mile north of Kent, King Co., Washington, Feb. 1 and Mar. 14, 1954, J. E. Lynch, collector. 1 ♀, ovigerous, from among weeds of seasonal roadside ditch pond, about 3 miles south of Corvallis, Benton Co., Oregon, Mar. 8, 1954, M. S. Wilson and A. R. Roth, collectors.

Diagnosis: Subgenus *Bryocamptus;* with characters of *B. minutus* group (as defined, Lang 1948). Anal operculum with 8 large, non bifid spinules. Caudal ramus of female longer than anal segment and about 2.3-2.8 times its own greatest width, outer apex without distal spinous process; inner margin with distal group of stout spinules arranged in 2-3 rows. Caudal setae inserted at apex of ramus, both outer and middle setae jointed at bases. Caudal ramus of male like that of female but shorter (about 2-2.3 times width). Antennule of female 8-segmented. Mandible palp 2-segmented. Legs 2-4: exopod segment 3 with 3 outer marginal spines, the total number of spines and setae: 6,7,7; apical segment of endopod with total of 4,5,5 setae in female, that of leg 4 with 4 setae in male. Leg 5 of female, exopod with 5 setae, of which the second is extremely long, being more than 2 times the length of the first seta which is placed at the middle of the segment; basal expansion produced beyond middle of exopod segment, with 6 setae of which the fifth is the longest. Leg 5 of male, exopod with 6 setae, basal expansion produced to near end of exopod, with 2 very stout, subequal spines. Total body length of both sexes: 0.68-0.77 mm.

Bryocamptus umiatensis, new species

Specimens examined: Arctic slope of Alaska, E. B. Reed, collector: *Type lot*, 11 ♀, 3 ♂, seep water on terrace above Seabee Creek, Umiat, June 18, 1955; 1 ♂, lake at Umiat, June 19, 1955; 1 ♀ and 1 ♂, separate pools in area of junction of Kurupa and Colville Rivers, July 1 and 3, 1955.

Diagnosis: Subgenus *Bryocamptus.* Caudal ramus of both sexes with length subequal to anal segment and about equal to its own width, without ornamentation; outer and middle caudal setae enlarged basally, both jointed. Anal operculum with 3-5 widely spaced spinules in female, with 8 in male. Antennule of female 8-segmented. Mandible palp 2-segmented. Leg 1, exopod segment 2 with inner seta; endopod 3-segmented, reaching beyond exopod by about half length of segment 3, endopod segments 1 and 2 with inner setae. Legs 2-4: exopod segment 3 with 3 outer spines, total number setae and spines: 6,7,7; endopod of female legs 2 and 3, 3-segmented; of leg 4, 2-segmented;

apical segments with total number of setae: 4,5,5. Leg 2 of male, endopod 2-segmented; segment 1 with inner seta; segment 2 with characteristic outer marginal notch, with 2 short inner setae and 2 closely set terminal setae, placed subapically on inner side. Leg 3 of male, endopod armed apically with extremely stout, long seta about 3 times the length of total endopod; and with a modified seta about as long as endopod, stout at base and divided into 2 apical processes by an incision that extends from apex to about the middle. Leg 4 of male, endopod segment 1 with inner seta and apical segment with 4 setae. Leg 5 of female, exopod segment oval in shape, with 5 setae; basal expansion irregularly produced to about middle of exopod, with 5 setae, the first extremely short and slender, prominent gap between setae 2 and 3. Leg of male, exopod with 6 setae; basal expansion with very short outer seta and much longer inner seta. Total body length of both sexes: 0.65-0.68 mm.

Remarks: This species has the caudal ramus and leg 5 of the female similar to those of *B. tarnogradskyi* Borutzky, from the Caucasus Mountains of southeastern Europe. It differs from this and all other species of *Bryocamptus* in the unusual modification of the apical setae of the endopod of the male third leg. This does not appear to be an anomaly inasmuch as it occurs symmetrically on each leg of the pair, and is present in specimens collected from separate pools and areas.

Paracamptus reggiae, new species

Specimens examined: *Type lot,* 13 ♀ (2 ovigerous), 3 ♂, from vegetation at edge of small bog pond, about Milepost 38, Steese Highway, northeast of Fairbanks, east central Alaska, July 15, 1955, M. S. Wilson, collector. 1 ♀, from vegetation of shallow pool, Saint Matthew Island, (Bering Sea) Alaska, Sept. 2, 1954, R. and R. Rausch, collectors.

Diagnosis: Caudal ramus of female shorter than anal segment (about 13:18) and about twice its own greatest width; with inner and outer marginal hairs and a basal crosswise crest of very fine, short hairs. Caudal ramus of male shorter than that of female, about half of the length of the anal segment. Stout middle caudal seta longer than urosome (including somite of leg 5) in both sexes. Leg 1, endopod reaching beyond exopod by nearly the length of second segment; segment 2 armed apically with elongate spine and much longer seta. Legs 2-4: exopod segment 3 with 5,5,4 spines and spiniform setae; endopods of female 2-segmented, the apical segment with extremely short outer seta and longer inner seta; apical endopod segment of male legs 2 and 4 with short outer seta and 2 elongate spiniform setae. Leg 3 of male, endopod with single apical seta modified, broadened throughout and with tip flattened and expanded. Leg 5 of female with the third seta of exopod not different from the other setae, being of similar stoutness and ornamentation, subequal to or longer than the innermost seta. Leg 5 of male, third seta of exopod plumose and stout like other setae but shorter than the second and fourth setae; basal expansion with 2 setae, the innermost nearly twice the length of the outer and exceeding the length of the longest exopod seta. Total body length: ♀ 0.68 mm. ♂ 0.6 mm.

Remarks: This species closely resembles the European *P. schmeili* (Mrazek) from which it differs principally in having the third exopod seta of the fifth leg of both sexes similar in stoutness and ornamentation to the other setae. The species is named for Mrs. Reggie Rausch who patiently collected many harpacticoids on Saint Matthew Island.

Mesochra alaskana, new species

Type lot: 25 ♀ ♂, Naknek Lake, Alaska Penensula (about lat. 59°N., long. 156°W.), Alaska, surface tow, Sept. 2, 1949, G. Eicher, collector. Also collected abundantly in fresh water lakes on Adak Island, Aleutian chain (Everett Schiller and Robert Rausch, collectors), and in Matanuska Valley near Palmer, Alaska (C. S. Wilson, collector).

Diagnosis: Habitus and appendages of both sexes, except leg 1, very similar to *M. rapiens* (Schmeil). Urosome spination differing ventrally from *M. rapiens* in that all spinules are enlarged to similar size, and arranged in small groups of 2-5. Anal operculum of both sexes with spinules. Caudal ramus about as long as broad, outer distal margin constricted; middle caudal seta enlarged basally for about one-fifth of its length. Antennule of female 7-segmented. Leg 1 of both sexes, endopod 3-segmented, the first segment reaching considerably beyond the exopod, ratio of its actual length to that of total exopod about 1.26:1; relative length of endopod segments to one another 38:5:9. Other legs, including modified leg 3 of male, very similar to those of *M. rapiens*, except that the length of the exopod of the male fifth leg is about twice its width.

Remarks: This form differs strikingly from *M. rapiens* in the development of the endopod of the first leg, both as described from brackish and fresh water bodies of Europe and as observed on the Bering Sea coast of Alaska. In descriptions and in keys in the literature, the first segment of the endopod of *M. rapiens* is indefinitely spoken of as reaching beyond or as being about as long as the exopod, but its actual length is much less since the attachment of the two rami is at distinctly different levels on the basal segment. In Alaskan specimens of *M. rapiens*, the ratio of the actual length of the endopod to the total exopod is about 0.79:1, and endopod segments 2 and 3 are subequal to one another. Since the two forms are so similar in other ways, it is admittedly questionable whether the status of the new Alaskan form, confined in present knowledge to fresh water, is that of a full species. Such status is given here because the length of the endopod of the first leg, and particularly of the first segment, constitutes one of the primary characters differentiating species of the genus.

FAMILY CLETODIDAE

Huntemannia lacustris, new species

Type lot: 38 ♀ (3 ovigerous), 29 ♂, Bear Lake, Utah, horizontal haul in shallow water, July, 1957, W. J. Clark, collector.

Diagnosis: Habitus and appendages of similar structure and armature to *H. jadensis* Poppe. Caudal ramus about same length as anal segment, second outer lateral seta placed near middle. Caudal setae of female consisting of stout middle spinous production as long as or longer than ramus; the inner seta articulated, slender; the outer setiform and more or less set off from ramus, with basal portion enlarged and distal half attenuated, reaching to middle of spinous process or beyond. Caudal setae of male similar to those of *H. jadensis,* with stout middle spine twice the length of ramus or more; inner seta as in female; the outer a stout spinous process with incurved apex, as long as the ramus. Leg 1, exopod segments 2-3 fused or separate; endopod 1-segmented with 2 stout spines. Legs 2-4 of female, exopod segment 2 with 5,5,6 or 5,6,6 total spines and setae; endopod of legs 2-3 of a single reduced segment with 1 or 2 setae (the innermost reduced); endopod of leg 4 papilliform with a single long seta. Legs 2-4 of male, exopod segment 2 with 5,8,7 spines and setae; that of leg 3 modified, with 3 outer spines and 5 setae, the first two spines short, subequal to one another, the first stoutly serrate on outer margin, the second with coarse spinulations on each side; the third spine elongate; relative length of segment (outer margin) and spines: 9:5:6:17; endopods as in female, those of legs 2-3 with 2 setae, both well developed in leg 3; endopod of leg 4 with single long seta. Leg 5 of female, exopod length 2 times its width, with 5 setae; basal expansion with 4 setae, the innermost much stouter than the others. Leg 5 of male, both exopod and basal part a narrow lamina, each with 4 setae; leg 6 with 3 stout setae. Total body length: ♀ 0.8-0.86 mm. ♂ 0.7-0.95 mm.

Remarks: This is the first record of the genus *Huntemannia* from fresh water. The occurrence in Bear Lake is of particular interest because the lake is situated far inland, on the eastern slope of the Wasatch Mountains at an elevation of about 6,000 feet. *H. lacustris* occurred in association with the euryhaline species, *Mesochra rapiens* (Schmeil), and the fresh-water copepods, *Epischura nevadensis* Lilljeborg and *Canthocamptus robertcokeri,* described above.

H. jadensis Poppe is known only from marine habitats on the northern coast of Europe. *H. lacustris* differs from it principally in having the outer caudal projection of the female developed as an elongate seta instead of a short spinous spur; in the greater development of the exopod of the female fifth leg; in the relative size of the exopod spines and endopod setae of the third leg of the male; and in having 7 instead of 6 spines and setae on the second exopod segment of the fourth leg of the male.

LITERATURE CITED

Coker, Robert E. 1934. Contribution to knowledge of North American freshwater harpacticoid copepod Crustacea. Jour. Elisha Mitchell Sci. Soc., 50: 75-141, pls. 1-15.

Davis, Charles C. 1954. A preliminary study of the plankton of the Cleveland harbor area, Ohio. III. The zooplankton, and general ecological considerations of phytoplankton and zooplankton production. Ohio Jour. Sci., 54(6): 388-408, 5 figs.

Lang, Karl 1948. Monographie der Harpacticiden. 2 vols. 1683 pp., 610 figs. Stockholm.

Marsh, C. Dwight 1903. On a new species of *Canthocamptus* from Idaho. Trans. Wisconsin Acad. Sci., Arts, Letts., 14: 112-114, pl. 9.

McKee, Paul W. and R. E. Coker 1940. Notes on plankton Entomostraca of the Carolinas. Jour. Elisha Mitchell Sci. Soc., 56: 177-187.

Vol. 71, pp. 49-52 May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NORTH AMERICAN HARPACTICOID COPEPODS
5. THE STATUS OF *ATTHEYELLA AMERICANA* (HERRICK) AND THE CORRECT NAME FOR THE SUBGENUS *BREHMIELLA*

Mildred Stratton Wilson
Arctic Health Research Center, U. S. Public Health Service, Anchorage, Alaska

Herrick (1884) correctly recognized that the form to which he gave the name *Canthocamptus northumbricus* var. *americanus* is related to a species widely distributed in Eurasia and now known as *Attheyella dentata* (Poggenpol), on the authority of Gurney (1932) and of Lang (1948). Records of this group in American literature are listed as the variety or subspecies *americanus* or simply as *northumbricus*. Lang (1948) has referred American records to the subspecies *americana,* but as pointed out (M. S. Wilson, 1956), the typical form of *dentata* does occur in North America, having been found in collections from Alaska and western Canada.

The additional presence on the Continent of another species of the *dentata* group, *Attheyella dogieli* (Rylov) makes somewhat uncertain the identity of the specimens in published records not substantiated by description or available specimens. Alaskan and Canadian specimens of *dentata* agree very closely with Gurney's (1932) detailed description of British specimens. The species *dogieli* known from Manchuria (Rylov, 1923) and Japan (Chappuis, 1955) is closely related to *dentata,* but distinctly separable from it. In well-collected areas of Alaska, these two species occur throughout the same geographic regions and drainage systems. Although *dogieli* has been found more frequently in the marginal waters of large lakes, it has also been collected in ponds, pools and other small bodies of water that are on the whole more characteristic for *dentata.* On a basis of morphology and sympatric distribution, it is correct to consider these as two separate species.

Comparative studies of specimens and literature of the three forms now known to occur in North America point up structural characters in *americana* that have equal taxonomic value with those separating *dentata* and *dogieli.* Moreover, *americana* possesses an important individual distinction in the modification of the endopod of the male third leg.

For these reasons, Herrick's form is herein raised to the status of a species.

Attheyella (Mrázekiella) americana (Herrick)

Canthocamptus northumbricus, var. *americanus,* var. n., Herrick 1884: 170, Pl. O, figs. 6-14, 20-22; 1895: 130, Pl. 29, figs. 6-14, pl. 33, figs. 3-5.

? *Attheyella northumbricoides* Willey 1925a: 155; 1925b: 206.

? *Attheyella willeyi* (nom. nov. for *northumbricoides*) Kiefer 1929: 323.

Attheyella (Brehmiella) northumbrica subsp. *americana,* Chappuis 1929a: 48; 1929b: 488; 1931: 359 (refers *northumbricoides* and *willeyi* to *n. americana).*

Atthleyella northumbrica americana, Kiefer 1931: 604, figs. 53-55.

Attheyella northumbrica americana, Coker 1934: 106, Pl. 6, Pl. 7, figs. 3-5.

Attheyella (Brehmiella) dentata subsp. *americana,* Lang 1948: 977, fig. 387a.

Attheyella dentata americana, M. S. Wilson 1956: 293.

The above references include only those of significance in synonymy and nomenclature. The name *northumbricoides* is listed with a question mark because Willey's description, unaccompanied by figures, does not seem sufficiently precise to indicate which of the three American species he actually had. The known distribution, as determinable from substantiated records, includes Minnesota (Herrick, 1884, 1895), Wisconsin and North Carolina (Coker, 1934), and Connecticut (Kiefer, 1931). Willey's questionable record is from Quebec. In addition, the species has been reported from Massachusetts (Pearse, 1906) Bear Lake, Idaho (Kemmerer et al, 1923), and Michigan (Kenk, 1949). Marsh's (1926) record of Florida specimens are listed only as *northumbricus,* but are probably referable to *americana;* other references in the literature to *northumbricus* that may or may not bear the same interpretation are those of Moore (1939) from Michigan, and of Ewers (1930) and Ward (1940) from Ohio.

New records of *Attheyella americana* from my collections are:

Florida: Lake Jackson, Leon Co., April 3, 1950, Murray Voth, coll.

Louisiana: roadside ditch, 1 mile west of Clarence, Natchitoches Parish, Feb. 11, 1956, J. E. Sublette, coll.

The most complete and reliable description of *americana* is that of Coker (1934). Herrick's description and figures leave no doubt that Coker's specimens are referable to the same form. Important in the characterization of the species is the very short caudal ramus (considerably shorter than the anal segment in both sexes), without dorsal or distal sclerotization as found in *dentata* and *dogieli,* and with the lateral setae placed far apart, the distal seta being attached near the apex.

Specimens of *americana* that I have examined agree with Herrick's and Coker's figures of the male third leg which has the second segment of the endopod elongate and produced into a weakly developed hypophysis. The slenderness and shortness of the hypophysis is in strong contrast to the stoutly developed and strongly outcurved process of *dentata* and *dogieli.* The specific importance of distinctive modification of any part of this appendage, particularly when it departs noticeably from the structure of closely related species, cannot be underestimated in the phylogeny and taxonomy of any canthocamptid.

The three known species of the *dentata* group in North America are separable by the following key:

1. Caudal ramus ♀ ♂, outer marginal setae placed close together and the outer distal edge of ramus continued as rounded sclerotization overlying the bases of the apical setae. Leg 5 ♀ ♂, exopod segment elongate, ♀ length from 2-3 times the greatest width, ♂ length about 2.6 times greatest width.
   Attheyella dogieli (Rylov) 1923
   Caudal ramus ♀ ♂, outer marginal setae not arising from same place, the inner distal edge of ramus not continued as sclerotization. Leg 5 ♀ ♂, exopod not so elongate. 2
2. Caudal ramus ♀ ♂ about as long as last body segment; on dorsal face of ♀ ramus a prominent triangular or semi-rectangular sclerotization. Leg 5 ♀ greatly broadened in basal portion. Leg 3 ♂, hypophysis of endopod strongly developed (enlarged and outcurved at base and reaching beyond apex of endopod by about half of its own length).
   Attheyella dentata (Poggenpol) 1874
   Caudal ramus ♀ ♂ shorter than last body segment, about as broad as long, without sclerotization on dorsal face. Leg 5 ♀ not greatly broadened in basal portion. Leg 3 ♂, hypophysis of endopod weakly developed (hardly enlarged and not outcurved at base, reaching beyond endopod by only about one-third of its length).
   Attheyella americana (Herrick) 1884

The Correct Name for *A.* (*Brehmiella*) Chappuis

Attheyella dentata is the type species of the subgeneric grouping named *Brehmiella* by Chappuis (1929a). Attention was drawn by Brehm (1949) to the fact that this name is preoccupied by *Brehmiella* Pascher 1928. Brehm proposed the new name *Mrázekiella* for *Brehmiella* Chappuis. This appears to have been overlooked by specialists in the Harpacticoida, and so far as is known, the name has not yet been used in the literature. Since Brehm's nomenclature correction is valid, the name for the subgenus of which *A. dentata* is the type species, is *Mrázekiella* Brehm 1949.

LITERATURE CITED

Brehm, Vincenz. 1949. Prioritätsbedingte Namensänderung. Arch. Hydrobiol., 42: 515.

Chappuis, P.-A. 1929a. Revision du genre *Canthocamptus* Westwood (Note preliminaire). Bull. Soc. Sci. Cluj, 4: 41-50.

——— 1929b. Die Unterfamilie der Canthocamptinae. Arch. Hydrobiol., 20: 471-516.

——— 1931. Campagne spéologique de C. Bolivar et R. Jeannel dans l'Amérique du Nord (1928). 4. Crustacés Copépodes. Arch. Zool. Exper. Gen.) 71: 345-360, 22 figs.

——— 1955. Harpacticoides troglobies du Japon. Notes Biospeol., 10: 183-190, 29 figs.

Coker, Robert E. 1934. Contribution to knowledge of North American fresh water harpacticoid copepod Crustacea. Jour. Elisha Mitchell Sci. Soc., 50: 75-141, pls. 1-15.

Ewers, Lela A. 1930. The larval development of freshwater Copepoda. Ohio State Univ. Franz Theo. Stone Lab. Contrib. no. 3: 1-43, pls. 1-13.

Gurney, Robert. 1932. The British Fresh-Water Copepoda. Vol. 2. 336 pp., figs. 345-1195. Ray Society, London.

Herrick, C. L. 1884. A final report on the Crustacea of Minnesota included in the orders Cladocera and Copepoda. 12th Ann. Rept. Geol. Nat. Hist. Survey Minnesota for 1883, pp. 3-191, pls. A-V.

———— 1895. Copepoda of Minnesota. in: C. L. Herrick and C. H. Turner, Synopsis of Entomostraca of Minnesota. Zool. Ser. II, Geol. Nat. Hist. Survey Minnesota. 525 pp., 81 pls.

Kemmerer, George, J. F. Bovard and W. R. Boorman. 1923. Northwestern lakes of the United States: biological and chemical studies with reference to possibilities in production of fish. Bull. Bur. Fish., 39: 39-140, 22 figs., 13 tables.

Kenk, Roman. 1949. The Animal Life of Temporary and Permanent Ponds in Southern Michigan. Misc. Publ. Mus. Zoology, Univ. Michigan, no. 71, 66 pp., pls. 1-2, 7 figs.

Kiefer, F. 1929. Beitrage zur Copepodenkunde (XIII). Zool. Anz., 83: 319-325, 19 figs.

———— 1931. Zur Kenntnis der freilebenden süsswassercopepoden, insbesondere der Cyclopiden Nordamerikas. Zool. Jahr., 61: 579-620, 55 figs.

Lang, Karl. 1948. Monographie der Harpacticiden., 2 vols., 1683 pp., 610 figs. Lund.

Marsh, C. Dwight. 1926. On a collection of Copepoda from Florida with a description of *Diaptomus floridanus*, new species. Proc. U. S. Natl. Mus., 70, art. 10, 4 pp., 6 figs.

Moore, George M. 1939. A limnological investigation of the microscopic benthic fauna of Douglas Lake, Michigan. Ecol. Monogr., 9: 537-582, pls. 1-3, 13 figs.

Pearse, A. S. 1906. Fresh-water Copepoda of Massachusetts. Amer. Nat., 40: 241-251, 9 figs.

Rylov, V. M. 1923. On the eucopepodean fauna of Mantshuria. Ann. Mus. Zool. Sci. Russia, 24: 52-95, pls. 1-3.

Ward, Elizabeth. 1940. A seasonal population study of pond Entomostraca in the Cincinnati region. Amer. Midl. Nat., 23: 635-691, 11 figs.

Willey, Arthur. 1925a. Northern Cyclopidae and Canthocamptidae. Trans. Royal Soc. Canada, 3rd Ser., 19: 137-158, pls. 1-3.

———— 1925b. Copepods in the northern hemisphere. Nature, 116: 206, 1 fig.

Wilson, Mildred Stratton. 1956. North American Harpacticoid Copepods. 1 and 2. Trans. Amer. Micr. Soc., 73: 290-307, 20 figs.

Vol. 71, pp. 53-56 May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TYPE LOCALITIES AND NOMENCLATURE OF SOME AMERICAN PRIMATES, WITH REMARKS ON SECONDARY HOMONYMS

By Philip Hershkovitz

Curator of Mammals, Chicago Natural History Museum

Several problems of general zoological and nomenclatorial interest are presented in a recent publication entitled "Notes on the Primates of Suriname," by A. M. Husson (1957, Studies on the fauna of Suriname and other Guyanas, **1**, (2): 13-40, 8 pls., 1 fig.).

Husson lists and describes the 8 species of monkeys known to occur in Suriname. The generic name he used for one of the monkeys is antedated and must be replaced. The type locality of each of two other species was restricted by him in a manner that failed to take into account some pertinent facts. The specific name of a fourth species was needlessly changed in conformity with notions which undermine the foundations of nomenclatorial stability.

Each objection is discussed here under a separate heading.

Saguinus (*Saguinus*) *midas midas* Linnaeus

Simia Midas Linnaeus, 1758, Syst. Nat., ed. 10, **1**:28.

Marikina (*Tamarin*) *midas*, Husson, 1957, Studies on the Fauna of Suriname and other Guyanas, **1**, (2): 37.

Type locality.—"America"; restricted to Suriname by Schreber, 1775 (Saügthiere, **1**:132).

Remarks.—Husson has affirmed that the type locality of *Simia midas* was first restricted to Suriname by Schreber, 1775, then by Gmelin, 1789. No further action, such as "selection" of the "restriction," is required.

Saguinus Hoffmannsegg (1807, Mag. Gesellsch. Naturf. Fr. Berlin, **1**:102), with type by monotypy, *Saguinus ursula* Hoffmannsegg [=*Saguinus tamarin* Link] antedates *Tamarin* Gray, 1870, with the same type species. *Saguinus* is also the first valid generic name for the group of marmosets characterized by normal lower canines.

The following genera and subgenera of the group are recognized.

Genus *Saguinus* Hoffmannsegg, 1807 (tamarins)

Saguinus Hoffmannsegg, 1807 (synonyms: *Leontocebus* Wagner, 1840; *Leontopithecus* Lesson, 1840; *Tamarin* Gray, 1870; *Cercopithecus* Gronov, 1763, rejected name; *Midas* Humboldt, 1812;

preoccupied; *Mystax* Gray, 1870, preoccupied; *Tamarinus* Trouessart, 1899).

Oedipomidas Reichenbach, 1862 (synonyms: *Oedipus* Lesson, 1840, preoccupied; *Hapanella* Gray, 1870).

Marikina Lesson, 1840 (synonym: *Seniocebus* Gray, 1870).

Genus *Leontideus* Cabrera, 1956 (little lion monkeys).

Synonyms: *Marikina* Reichenbach, 1862, not of Lesson, 1840; *Leontocebus* of authors, not Wagner, 1840 (see Cabrera, 1956, Neotropica, 2:45: Hershkovitz, 1957, Proc. Biol. Soc. Washington, 70:17).

Hill's classification of the marmosets in volume three of his monograph ''Primates'' (1957) has been taken into account in the above arrangement. It is proposed to review his work elsewhere.

Ateles paniscus paniscus Linnaeus.

Simia Paniscus Linnaeus, 1758, Syst. Nat., ed. 10, **1**:26.

Ateles paniscus paniscus, Husson, 1957, Studies on the fauna of Suriname and other Guyanas, **1**, (2): 34.

Type locality.—''America meridionali: Brasilia''; redetermined as ''America meridionali'' by Linnaeus (1766, Syst. Nat. ed. 12, **1**:37) and restricted to ''La Guyane,'' i.e., French Guiana, by E. Geoffroy (1803, Cat. Mann. Mus. Hist. Nat., Paris, p. 6; 1812, Ann. Mus. Hist. Nat., Paris, 19:105).

Remarks.—As shown by Kellogg and Goldman (1944, Proc. U. S. Nat. Mus., 96:15), the first, or 1758, Linnaean description of *Simia paniscus* is a composite of spider monkey and Brazilian howler, the *guariba* of Marcgrave. In his 1776 account of *Simia paniscus,* Linnaeus recognized the composite nature of the earlier description and he dropped the reference to Brazil and the *guariba.* Linnaeus, therefore, as first reviser, eliminated Brazil as a necessary part of any future restricted type locality. Selection of Pernambuco, Brazil, where *Simia paniscus* does not occur, by Thomas (1911, Proc. Zool. Soc. London, 1911:127) can apply only to the *guariba.* Husson's redetermination of the type locality as Jamundá, Pará, on the assumption that the type locality must be Brazilian, is unwarranted.

Cebus apella apella Linnaeus

Simia Apella Linnaeus 1758, Syst. Nat. ed. 10, 1:28.

Cebus apella apella, Husson, 1957, Studies on the fauna of Suriname and other Guyanas, **1**, (2): 26.

Type locality.—''America,'' restricted by Humboldt (1812, Rec. Obs. Zool. Anat. Comp., 1:355) to ''la Guyane françoise et la Terre-Ferme;'' further restricted by E. Geoffroy (1812, Ann. Mus. Hist. Nat., Paris, **19**:109) to ''la Guyane,'' i.e., French Guiana (see also Hershkovitz, 1955, Journ. Mammal., **36**:451).

Remarks.—Husson indicates that he has consulted the works cited above but he points only to Elliot as his ''authority'' for the claim that Suriname is the type locality of *Cebus apella.*

Secondary Homonyms and Status of the Name

Cebus nigrivittatus Wagner, 1848

The identification of *Cebus nigrivittatus* Wagner, 1848, as the untufted species characterized by the wedge-shaped cap is accepted by Husson. This author, nevertheless, rejects the name because it had been treated once as a secondary homonym. Husson's position is derived from Pusch (1941, Zeitschr, Saüget., 16:145), who combined *Saimiri* with *Cebus* and declared *Cebus nigrivittatus* Wagner, 1848, a junior secondary homonym of *Chrysothrix* [=*Saimiri*] *nigrivittatus* Wagner, 1846. In my revision of the untufted species of *Cebus* (1949, Proc. U. S. Nat. Mus., 98:345), I denied Pusch's classification and the homonomy it entailed. Hudson also rejects Pusch's systematics but, paradoxically, strives to suffer its illusory consequences. Husson's arguments for dropping the name *Cebus nigrivittatus* Wagner, 1848, are a series of quotations from Follett's ''An unofficial interpretation of the International Rules of Zoological Nemenclature . . .,'' a work issued in 1955 as ''not published'' and (p. i) ''not to be quoted as authority for any nomenclatorial proposition.'' Husson also assists his reasoning by references to the ''Copenhagen Decisions on Zoological Nomenclature,'' a quasi-official modification and clarification of certain Articles of the Rules. The existing Rules fail to distinguish between primary homonyms wholly subject to nomenclatorial discipline, and secondary homonyms which are essentially non-regulatory zoological, or philosophical, concepts.

Primary homonyms are objective or nomenclatorial homonyms. They are born homonyms and can never be anything else. There are comparatively few primary homonyms, and were it not for carelessness or ignorance there would be none. In contrast, nearly all secondary homonyms are subjective homonyms. They exist only as opinions, or illusions, that the animals bearing the names belong to genera other than the ones in which they were first described. There is no limit to the number of secondary homonyms that can be evoked in the minds of men and expressed in their schemes of classification. Every technical name proposed since the 10th edition of the Systema Naturae is a potential secondary homonym.

The problem of subjective secondary homonyms is by and large a zoological problem. It may also be a nomenclatorial problem but only transitorily. Its treatment should be on a corresponding transitory, or temporary, basis. The menace to nomenclatorial stability contained in the philosophy of ''permanent rejection'' of subjective secondary homonyms must be obvious. Pusch, acting in good faith, united only *Saimiri* with *Cebus* and produced one subjective secondary homonym. Another student, with equally good intentions, may, like Linnaeus, combine all Primates, except man, in but one genus. The secondary homonyms created by this drastic revision would result in wholesale elimination of universally accepted names if Husson's line of reasoning were followed.

The International Commission on Zoological Nomenclature cannot and must not pretend to exercise control or censorship over the minds or methods of zoologists and systematists. An author is free to create as many secondary homonyms as may be required to assert his concepts of classification. That author is free to rename as many secondary homonyms as he sees fit. At the same time, no ruling of the International Commission can make acceptance of such revisions compulsory or, what is tantamount, oblige the student to recognize the nomenclatorial upheavals spawned by the revolutionary concept of ''permanent rejection'' of secondary homonyms.

Husson's application of the policy of ''permanent rejection'' of secondary homonyms illustrates the absurd and pernicious effects of the practice. The name *Cebus nigrivittatus* Wagner, 1848, is ''permanently rejected'' by Husson, because in the mind of one and only one author, it is a secondary homonym of *Chrysothrix nigrivittatus* Wagner, 1846. Husson (op. cit. p. 32) elects *Cebus olivaceus* Schomburgk, 1848, as the next available name for replacement. He also seems to be particularly elated that this move disposes of the problem of priority between *olivaceus* Schomburgk 1848 and *nigrivittatus* Wagner 1848. Actually, nothing is settled by this manipulation. The same devious reasoning that led Husson to reject *nigrivittatus* Wagner will oblige him to discard *olivaceus* Schomburgk. In his classification of mammals, Fischer (1829, Syn. Mamm. p. 41) includes the woolly monkey originally described as *Gastrimargus olivaceus* Spix, 1823, in his genus *Cebus*. This kills off *Cebus olivaceus* Schomburgk 1848. The next name in line for replacement is *Cebus castaneus* I. Geoffroy, 1851. Before adopting this binomial, however, it behooves the advocates of ''permanent rejection'' to examine every published work, whether by scholar, hack or crank, for possibilities of secondary homonomy. While the search goes on the writer rests with *Cebus nigrivittatus* Wagner, 1848, as the first valid name that must be used for the species in question.

Vol. 71, pp. 57-60 May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

FIVE NEW SOUTH AMERICAN CHILOPODS

Ralph V. Chamberlin

The five new species, including one new genus, of chilopods here described are represented in two small collections made by Borys Malkin in August and September, 1957. One of these collections was made in the state of Goias, Brazil, the other in the states of Trujillo and Portogueza, Venezuela.

Scolopendridae

Rhoda isolata new species

Dorsum brown, with head, last tergite and anal legs of a somewhat chestnut tinge.

Head small, decidedly narrower behind than the first tergite by which it is overlapped; a fine median longitudinal suclus which extends forward to the frontal level. No basal plates. Antennae thick at base, strongly attenuated distad, composed of 17 articles.

Prosternum anteriorily with 3 - 3 teeth of which the two innermost on one side are partially fused in the type specimen; a transverse sulcus more obscure than in *calcarata.* Claws of prehensors when closed not surpassing anterior margin in head.

Paired dorsal sulci present on tergites 1 to 20, but on the first of these not quite reaching the anterior margin. Last tergite laterally margined and with a deep median longitudinal sulcus. First and second tergites about equal in length, considerably shorter than the third and fourth which are subequal to each other but clearly shorter than tergite 5. Paired sulci present on sternites 2 to 21. The last sternite strongly rounded behind. Coxopleurae without caudal processes and also lacking spinules.

Anal legs very thick as in *calcarata;* prefemur on mesoventral line with three spinules of which the median and distal arise from a raised base; a series of 3 sponules on mesal face and 1 or 2 on mesodorsal line in addition to the large process at distal end, the latter bearing two spinous points.

Legs 1 to 19 with a tarsal spine.

Length, 43 mm.

Locality.—Brazil: State of Goias, Santa Isabel, Ilha do Bananal, Rio Aragusa. Two specimens taken August 15-22, 1957; by Malkin.

In general structure this species agrees with *R. calcarata* (Pocock) but a smaller and darker species differing in having the paired dorsal sulci beginning on tergite 1 instead of on 2, in having 3 equal in length to 4 and shorter than 5 instead of having 4 longer than either 3 or 5, and also in having the claws of the prehensors when closed not surpassing the anterior margin of the head.

Of two other members of the Scolopendridae occurring at the same locality, *Scolopendra angulata* Newport, a species widespread in South America, is most abundantly represented, while *Scolopendra viridicornis* Newport is represented by one specimen.

Cryptopidae

Cryptops goiasus new species

Yellow, the head and first tergite light chestnut; legs and antennae yellow.

Cephalic plate with two longitudinal sulci extending from caudal margin well toward anterior border.

First tergite with cervical sulcus evenly curved; also with paired longitudinal sulci which continue beyond the cervical sulcus to the anterior margin of the plate. The other tergites from the second on also with complete paired paramedian sulci, and also with lateral sulci from the third tergite or these indistinct also on the second tergite.

Prosternum with margin convex on each side, the median angle shallow and obtuse; margin fith four or five short setae.

Last ventral plate trapeziform, the caudal margin wide, forming at middle a slightly obtuse reentrant angle; coxal pores few, not extending to caudal margin of coxa.

First tarsus of anal legs with a series of four teeth beneath; tibia with six teeth, with no lateral terminal tooth, a series of spinules along distal margin and with numerous spinules beneath where they leave amedian naked strip which is very narrow on prefemur but wide on femur.

Length, 20 mm.

Locality.—Brazil, state of Goias, Goiania August, 1957. One specimen. Borys Malkin collector.

This species seems to be readily distinguished from *heathi* and other related species by the paired longitudinal sulci of the first tergite which do not meet or cross and by the extension of these sulci cephalad of the cervical sulcus taken in conjunction with the long paired sulci of the head.

Newportia sargenti new species

General color orange brown.

Head smooth, without sulci. Antennae composed of 16 articles. Anterior margin of prosternum not protruding, horizontal and nearly straight, each half only slightly convex, the median sinus shallow and obtuse, the chitinous rim narrow.

First tergite overlapped by the cephalic plate, rather short, entirely lacking cervical sulcus as well as longitudinal sulci.

Paired paramedian longitudinal sulci first distinct on the fourth tergite; oblique lateral sulci deeply impressed.

Last ventral plate long, trapeziform, its sides gently convex. Coxal processes long and slenderly acute; no spinules; poriferous area extending to caudal end of coxa.

Prefemur of anal legs with a series of four large spinous process beneath. Femur beneath with two denticles, one toward base and one at middle. Tibia without spinules. First tarsal joint shorter than tibia and longer than second tarsal article than which it is but little thicker; the five articles beyond first tarsal article proportionately long and slender.

Length, 21 mm.

Locality.—Venezuela: taken on road of Bocono-Trujillo pass on Atlantic Pacific divide, state of Trujillo, at elevation of 2500-3000 m.(?). One specimen taken September 15, 1957, by B. Malkin and M. J. Sargent.

A species distinct from all other members of the genus so far known in lacking a cervical sulcus on the first tergite. The anal legs are also distinctive.

Ballophilidae

Genus **Koinethmus**, new

Unlike other known genera of the Ballophilidae with the exception of *Taeniolinum* in having the ventral pores diffuse and distributed in one or two transverse bands rather than condensed in one or two sharply defined submedian areas. From *Taeniolinum* it differs in having the tarsus of the anal legs composed of one instead of two articles. Prosternum lacking sclerotic (chitinous) lines. Ventral pores in one, or in part two transverse bands. Coxal pores simple, one on each side. Antennae subfiliform, not clavate.

Generotype.—*Koinethmus guanereus* new species.

Koinethmus guanereus new species

Preserved specimen yellow, no darker pigment being preserved; head light chestnut.

Head small, widest behind middle; rounded anteriorly, the caudal margin slightly abtusely angled at middle. Antennae not clavate and not geniculate; a little thickest at ninth and tenth articles, the section beyond which is thus somewhat set off; last article large, subacutely conical.

Ventral pores beginning on the second sternite; on anterior sternites the pores form two narrow transverse lines or bands, these bands not elevated or otherwise sharply defined; on the more posterior sternites the pores form but single, wider, band behind middle.

Body narrowed over several segments behind the first one.

Anal legs crassate, narrowing continuously distad; composed of but five articles beyond the coxa. One large simple gland on each anal coxa, its pore located posteriorly and free from the sternite. Sternite trapeziform.

Pairs of legs, 71.

Length, 22 mm.

Locality.—Venezuela: state of Portogueza, Guanare. One specimen taken September 10-17, 1957.

Pselliodidae

Pselliodes subglaber new species

Dorsum with a median longitudinal yellow stripe which is bisected by a rather faint median line, the yellow stripe extending also on the head where it is furcate between the bases of the antennae. Each side of the median yellow stripe a brown stripe separated from the lateral margin of the tergites by a narrow yellow submarginal line. Legs with prefemora and femora with three yellow annuli of which the distal one may be more or less obscure; tibia brownish, with a submedian and distal annulus of yellow; tarsi and antennae ferruginous.

Articles of first division of antennae for the most part distinctly longer than broad, shorter ones occurring at intervals; second division composed of 275 plus articles, with shorter articles intercalated at intervals. The division shows no definite distinction of a third division.

Tergites bearing numerous well-spaced spiules which are more numerous toward the middle and are more abundant on the posterior plates than on the anterior ones; marginal spinules directed dorsad except in the caudolateral part; the spinules not accompanied by hairs or hair points. Stoma large, reaching posterior excavation or slightly extending into it as a low convexity.

Anal tergite strongly narrowed caudad, its narrow caudal end blunt, its margin nearly straight, bearing numerous spinules above. The preceding tergite also strongly narrowed caudad, its caudal margin incurved at middle, clothed with numerous spinous points.

Gonopods of female with prongs about three times as long as the consolidated basal portion; the prongs parallel, each presenting the usual angle or shoulder on the mesal side at middle of length, the angle setose.

Length: 28 mm.

Locality.—Brazil, state of Goias, Santa Isabel, Ilha de Bananal, Rio Araguaia. Two females taken August 22, 1957. Borys Malkin.

In general appearance and structure suggesting *P. andicolens* but readily distinguishable from this and other known related species in the unusual complete absence of hair points between the dorsal spinules of the tergites.

Vol. 71, pp. 61-62 May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF *CINARA* (APHIDAE) FROM SITKA SPRUCE

F. C. Hottes

The new species described herewith was sent me to determine by Prof. E. O. Essig who through the years has contributed greatly to our knowledge of the family Aphidae.

Cinara sitchensis n. sp.

Apterous viviparous female.

Length from vertex to end of cauda varying from 2.40-2.55mm. All specimens have been cleared and mounted very flat, so that the actual length may vary considerably from that given. Nothing has been recorded as to the color of living specimens, but alcoholic specimens have been described as being ''pinkish maroon.'' Color of cleared mounted specimens as follows: head pale tan, abdomen pale with the cornicles tan but indistinctly separated in color from abdomen at the margin. Antennal segments one and two concolorous with head, remaining antennal segments, very light tan almost uniform in color, or with the sixth antennal segment slightly darker. Femora pale at the base, turning to pale brownish at the apex. Tibiae pale brown with an area on the basal half of segment somewhat lighter in color, but not distinctly so. Tarsal segments concolorous with ends of tibiae.

Head and thorax. Antennal segments with the following lengths: III .36-.45mm., IV .12-.15mm., V .15-.18mm., VI .12-.15 + .03mm. Sensoria distributed as follows: III, as a rule, no secondary sensoria, but one specimen has two secondary sensoria on this segment. IV as a rule no secondary sensoria but one specimen has one secondary sensorium on this segment. V as a rule one secondary sensorium, but there may be two. Hair on antennae not numerous, more upstanding on anterior margin of segment than on posterior. On the anterior margin the hairs are about .05mm. in length. Hairs on sixth antennal segment longer than usual.

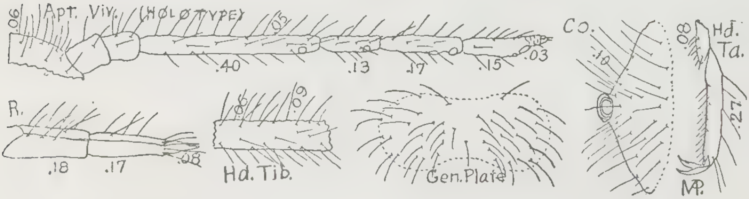
Marginal sensoria on sixth antennal segment with wide rims, arranged in a straight row. Ocular tubercles apparently absent. Last three segments of the rostrum with the following lengths: .18, .17, .08mm. Mesosternal tubercle absent. Length of prothoracic femora varying from .67-.72mm. Length of prothoracic tibiae varying from .75-.90mm. Length of metathoracic femora varying from .90-1.05mm. Length of metathoracic tibiae varying from 1.35-1.57mm. Both the metathoracic femora and tibiae are comparatively short. Metathoracic tarsal segments with the following lengths: .08-.09, .27mm. Hairs on metathoracic tibiae more upstanding on outer margin than on the inner margin, on this surface varying from .06-.09mm. in length, with most of the hairs about .06mm. long. Hairs on inner margin of tibiae more numerous than the hairs on the outer margin. Hairs on ventral surface of the first metatarsal segment numbering about ten, but difficult to count, located on the apical half of segment. Hairs on ventral surface of the second metatarsal segment much more numerous than the hairs on the dorsal surface, but shorter. Union of first and second tarsal segments, about equal to width of second tarsal segment.

Abdomen. Cornicles rather flat, with outer margin poorly differentiated from dorsum of abdomen. Width of cornicles about .375mm. Hairs on cornicles evenly distributed over the surface, about .10mm. in length and similar to the hairs on the dorsum of the abdomen. Hairs on the dorsal and ventral surfaces of the abdomen similar.

The two pigmented spots anterior to the cauda have two rows of hairs. Anal plate and cauda with a setulose surface, anal plate with numerous hairs.

Holotype apterous viviparous female, deposited in the collection of E. O. Essig. Host, *Picea sitchensis* (Sitka spruce). Collected by P. S. Bartholomew, Crescent City, California, July 17, 1931.

In Palmer's key to the genus *Cinara* in Aphids of the Rocky Mountain Region this species keys with some difficulty to *C. villosa* (G&P), a species with which it is not allied, except by characters made use of in the key, and from which it may be differentiated by the fewer hairs on the tibie. It differs from *C. fornacula* H. by the shorter tarsal segments, shorter antennal segments, shorter tibiae and femora, as well as in the shape of the sixth antennal segment.



Cinara sitchensis n.sp.

Vol. 71, pp. 63-64 May 9, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW CANADIAN SPECIES OF *CINARA* (APHIDAE) FROM *PICEA RUBENS*

F. C. Hottes

It is pleasure to acknowledge the assistance of Mrs. M. E. MacGillivray who sent me the material from which this species is described.

Cinara nepticula n. sp.

Alate viviparous female.

Length from vertex to end of cauda varying from 3.45-3.60 mm. Color of living specimens not recorded, as represented by cleared mounted specimens as follows: head and thorax dark dusky brown. Antennal segments I and II concolorous with head, segments III IV and V light dusky with the apical portions of segments darker, VI almost uniformly dark. Femora dusky almost uniform in color, or with the metathoracic femora slightly darker at the apex. Tibiae dusky with the apical portions darker, the dark portion of the metathoracic tibiae most extensive, but extending less than half way up the tibiae. Tarsal segments concolorous with apex of tibiae. Cornicles dusky.

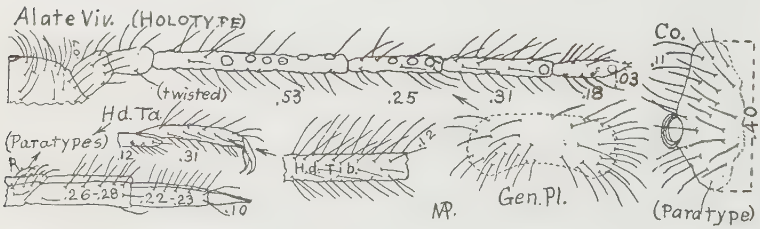
Head and thorax: Length of antennal segments as follows: III .53mm., IV .25mm., V .31mm., VI .18 + .03mm. Sensoria distributed as follows: III primary, plus five secondary sensoria arranged in a straight row, IV primary, plus two secondary, V primary, plus one secondary. All sensoria are large, slightly tuberculate, with wide rims, and quite regular in size. Antennal hairs fairly numerous, upstanding, set at an angle of more than sixty degrees, on third segment about .09mm. in length. Antennal segments III IV and V rather rough, but not imbricated, VI weakly imbricated. Marginal sensoria on sixth segment small arranged in a straight row rather far removed from the primary sensorium.

Median transverse suture well developed brown in color. Ocular tubercles well developed. Last three segments of the rostrum varying in length as follows, .26-.28, .22-.23, .10mm. Prothoracic femora varying in length from .97–1.05mm, metathoracic femora varying in length from 1.35–1.50mm. Prothoracic tibiae 1.35mm. long. Metathoracic tibiae varying in length from 2.25–2.40mm. Hairs on metathoracic tibiae numerous, upstanding about .12mm. in length. Hairs on outer surface of tibiae fewer, more upstanding and longer than hairs on inner surface. First metathoracic tarsal segment .12mm. in length, length of second segment .31mm. Ventral surface of first metatarsal segment with about sixteen hairs. Second fork of media far removed from margin of wing, closer to body than start of anal sector. Lateral and posterior median lobes of thorax with numerous long fine hairs which cover most of surface.

Abdomen. Hairs on dorsum of abdomen about .12mm. in length, fairly numerous, fine, roughly arranged in broad bands. Hairs on ventral surface of abdomen, more numerous than the hairs on the dorsum, not arranged in bands, otherwise similar to hairs on dorsum. Cornicles varying in width from .33-.40mm. the hairs on the cornicles are similar to those on the dorsum of the abdomen but slightly shorter, the hairs cover the entire surface and are evenly distributed over the surface. Anterior margin of cornicles more irregular than other margins. Orifice of cornicles closer to posterior margin that to anterior. The cornicles are rather flat. Each side of the dorsum of the abdomen has two rows of rather small wax pore plates. The genital plate has the hairs largely confined to the ends and posterior margin which is slightly concave. Hairs on the pigmented spots anterior to the cauda about .15mm. in length, the hairs cover a greater area in the middle of the spots than at the ends. Cauda and anal plate with setulae, both provided with numerous hairs.

This species may not be keyed in Palmer's key to the genus *Cinara* before couplet 10. Couplet 10 is based on apterous viviparous females which are not available. It may be assumed that the apterous viviparous female when known will have the hairs on the metathoracic tibiae longer than the width of the tibiae. Couplet 24 is also based on the length of hairs on the hind tibiae of apterous viviparous females, if the first alternative is followed this species keys to *C. braggii* (G). *C. nepticula* differs from *braggii* by having shorter hairs on the tibiae, the cornicles with more regular margins, more secondary sensoria, longer fourth, fifth and sixth antennal segments, smaller marginal sensoria. The second alternative of couplet 24 can not be completed.

Holotype alate viviparous female, deposited in the Canadian National Collection, Ottawa, Canada. Host *Picea rubens,* Melrose, Nova Scotia, Canada. Collected by F. G. Cuming.



Cinara nepticula n.sp.

Vol. 71, pp. 65-68 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE STATUS OF THE GRAY-BREASTED LEAST HONEY-GUIDES

By Herbert Friedmann*

In connection with comparative studies of small honey-guides of the genus *Indicator* occasioned by Chapin's recent discovery of a new and extremely small species in the eastern Belgian Congo, *Indicator pumilio,*[1] I was able to arrange an opportunity to investigate the status and relationship of *angolensis* Monard[2] and *meliphilus* (Oberholser),[3] an opportunity for which I am greatly indebted to the Royal Museum of Natural History in Brussels, the Musée d'Histoire Naturelle of La Chaux-de-Fonds, Switzerland, and the National Museum of Southern Rhodesia, Bulawayo. Previously (1954, 1955) I had treated *angolensis* as a synonym of *meliphilus* and had considered the latter as a race of *exilis.* However, I was careful to point out that there was some reason to think that further data might indicate that *meliphilus* was a distinct species, as both *exilis* and *angolensis* had been recorded by Verheyen (1953, pp. 406-407) from the Upemba Park, in the southern Belgian Congo, and *meliphilus* had been known to extend westward across Northern Rhodesia (Mwinilunga), an area where *exilis* (subsp. *pachyrhynchus*) had been taken (at Kansoku). Accordingly, if some form of *exilis* and *meliphilus* did occur together all the way from Northern Rhodesia to Lake Upemba, it would seem necessary to accord the latter full specific status. Chapin (1954, p. 633) accepted this conclusion and added *I. meliphilus* to his list of Congo birds.

Examination of Verheyen's interesting material proved him to be quite correct in distinguishing between his specimens of *angolensis* and of *exilis* from the Upemba Park. Verheyen also proved to be correct in calling his birds *angolensis* and not *meliphilus,* as they agree much more closely with the type specimen of the former bird from Tyihumbwe, Angola, than with that of *meliphilus* from Taveta, Kenya Colony. As a result of my present examination I find that there seems to be no question but that *angolensis* is a western form of *meliphilus.* I find it difficult to conclude otherwise than that *meliphilus* should now be treated as a species partly sympatric with *exilis,* although I must admit to a persistent suspicion that they may yet prove to be ecologically allopatric. The specimens of nominate *meliphilus* are considerably duskier below, especially on the throat, breast, and upper abdomen, than the type of *angolensis* and four other examples of this race from the southern Belgian Congo. The Congo birds are slightly paler below than Monard's type from Angola, but this may not be a constant geographic difference. There is no appreciable size difference between *angolensis* and *meliphilus,* as may be seen from the following figures: *angolensis*—type, unsexed, wing 77, tail 48.2, culmen from base 7.3mm., 4 specimens from the Belgian Congo have wing lengths of 78, 81 (males), 65 (female) and 74 mm. (unsexed). Two males from Abercorn, Northern Rhodesia, have wing lengths of 74.5 and 79; tail 49.2, 49.8; culmen from base 7.5 and 7.6mm.; a female from Port Herald, extreme southern Nyasaland, measures: wing 79, tail 46.1, culmen from base 7.4mm. By comparison, the type of *meliphilus* (male) has the wing 76, tail 48.3, culmen from base 7.7; a female has the wing 78, an unsexed bird 82 mm. The bill is very slightly stouter and heavier in *meliphilus* than in *angolensis,* but the number of specimens examined is too small to establish this as a constant character.

---

*Published by permission of the Secretary of the Smithsonian Institution.

[1] *Indicator pumilio* Chapin, Bull. Brit. Ornith. Club, vol. 78, 1958, p. 46 (Tshibati, southwest side of Lake Kivu, Belgian Congo).

[2] *Indicator minor angolensis* Monard, Arquivos do Museu Bocage, vol. 5, 1934, p. 55 (Tyihumbwe [Angola]; type in Musée d'Hist. Nat. de la Chaux-de-Fonds, Switzerland.

[3] *Melignothes exilis meliphilus* Oberholser, Proc. U. S. Nat. Museum, vol. 28, 1905, p. 869 (Taveta, Brit. East Africa: type in U. S. Nat. Museum).

It appears, then, that *Indicator meliphilus* is best treated as a specific entity composed of two races with the following ranges.

I. m. meliphilus: extreme eastern Uganda (Mount Moroto, Soronko River), and Kenya Colony from Turkanaland (Kacheliba) and the drier parts of the Suk area, east to the Taveta-Kilimanjaro plains, and south in suitable spots across Tanganyika Territory to Nyasaland (?) and to Mozambique (near Zobue, Kirk Mountains). Of this race *I. appelator* Vincent[4] and *I. narokensis* Jackson[5] are considered synonyms.

I. m. angolensis: Angola (Chitau, Tyihumbwe, Ebanga, and Quibula near Banguella) east to the southern Belgian Congo (Pelenge, Kaziba, Munoi, Upemba Park) and to Northern Rhodesia (Mwinilunga, Kabompo River, Abercorn, Fort Jameson), and southern Nyasaland (Port Herald).

In the present study I have seen but one Nyasaland example, and that from the extreme southern part of the country (Port Herald), but but it is a very pale bird, clearly *angolensis.* Whether the more northern Nyasaland records (Cholo, Ndirande, Mlanje), none of which are available for examination, are also *angolensis* or should be placed with *meliphilus* is uncertain. The two races should meet either in Nyasaland or in the areas immediately to the east. This Port Herald bird is paler below, with more of a pale yellow wash on the midventral area than are either of the examples from Abercorn, Northern Rhodesia, with which it was compared. In its extreme pallor, it agrees with those from the Upemba Park, in the Belgian Congo. It is marked by the collector (C. Long) as immature, but it has the rectrices rounded terminally as in adult birds, and shows no sign of immaturity.

---

[4] *Indicator appelator* J. Vincent, Bull. Brit. Orn. Club, vol. 53, 1933, p. 130 (near Zobué, on Portuguese East Africa—Nyasaland frontier, 2900 feet: type in Brit. Museum).

[5] *Indicator narokensis* Jackson, Bull. Brit. Orn. Club, vol. 19, 1906, p. 20 (Doinyo Narok Mt., Brit. East Africa: type in Brit. Museum).

The species, *I. meliphilus,* is, on the whole, somewhat larger and much more grayish, less greenish, especially below, than *exilis,* and still more markedly so than *pumilio.* It appears to inhabit more open, less humid regions and is extremely similar in coloration to the still larger *Indicator minor* with which it appears to be more or less sympatric.

REFERENCES

Chapin, James P.
1954. The Birds of the Belgian Congo, vol. 4. Amer. Museum Nat. Hist., vol. 75B, 846 pp.
1958. A new honey-guide from the Kivu District, Belgian Congo. Bull. Brit. Ornith. Club, vol. 78, pp. 45-47.
Friedmann, Herbert.
1954. A revision of the classification of the honey-guides, Indicatoridae, Ann. Mus. Congo, Tervuren, Zool., vol. 50, pp. 21-27.
1955. The honey-guides. U. S. Nat. us. Bull. 208, 292 pp.
Jackson, Frederick John.
1906. Descriptions of new species of birds from equatorial Africa. Bull. Brit. Ornith. Club, vol. 19, pp. 19-20.
Monard, Albert.
1934. Ornithologie de l'Angola. Arquivos do Museu Bocage, vol. 5, pp. 1-107.
Oberholser, Harry Church.
1905. Birds collected by Dr. W. L. Abbott in the Kilimanjaro region, East Africa. Proc. U. S. Nat. Museum, vol. 28, pp. 823-956.
Verheyen, Rene
1953. Oiseaux, *in* Exploration du parc national de l'Upemba, Mission G. F. De Witte, fasc. 19, 687 pp.
Vincent, Jack.
1933. New birds from Portuguese East Africa. Bull. Brit. Ornith. Club, vol. 53 pp. 129-149.

Vol. 71, pp. 69-74 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SIX NEW SPECIES OF CHINAIA FROM CENTRAL AMERICA (HOMOPTERA: CICADELLIDAE)

By James P. Kramer

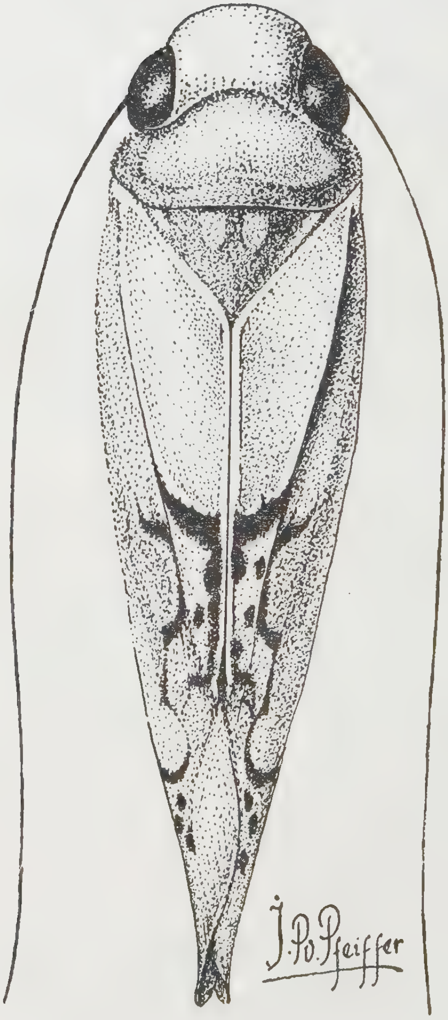
Entomology Research Division, Agr. Res. Serv., U.S.D.A.

The new species characterized herein are all brightly colored leafhoppers of the genus *Chinaia,* and closely resemble the genotype, *Chinaia bella* Bruner and Metcalf (1934 Bull. Brooklyn Ent. Soc. 29(3) :120-124). Inasmuch as the genotype was illustrated adequately, it has not been redrawn for this Publication. While the type series of *bella* was collected on avocado, indicating potential economic importance, no host records exist for any of the new species.

The general color patterns of the new species are very similar. All have an unmarked yellow to pale orange head, whereas that of *bella* is bordered posteriorly with bright orange. Like *bella,* they all have orange to bright orange lateral and posterior pronotal margins. In each species the large scutellum is predominantly orange. Anteriorly the clavus is pale yellow with a greenish cast, which is separated from the distal orange portion by an oblique dark brown marking. There are also additional brown markings in the distal portion of the clavus. *Chinaia permista* new species is the only one having an orange mark on the clavus like that of *bella.* The corium ranges from yellow to orange with or without brighter orange bands of varying distinctness. In most species there is an additional wavy pink band on the corium which is bordered distally with dark brown. The apical portions of the tegmina are light fumose hyaline with spots of dark brown. Venation is apparent only in the apical portion. The venter and legs range from yellow to pale orange.

Chinaia lepida new species [Plate I] serves as a general habitus for all of the species described in this paper. The exceedingly long antennae are frequently broken so that they often appear much shorter than illustrated. Even though color pattern seems to have some value in the recognition of species, study of the male genital structures is necessary for positive determinations.

All types have been deposited in the United States National Museum.


J.Po.Pfeiffer

Chinaia bifurcata new species

Length.—Male 5.25 mm.

Coloration.—Venter and legs, stramineous to yellow; face, vertex, and antennae pale orange. Pronotum pale orange fading to whitish with orange lateral and posterior margins. Scutellum orange with two colorless oval areas toward anterior margin and small colorless strips anteriorly along lateral margins. Clavus yellow with vague greenish cast, its tip orange with irregular anterior oblique dark brown marking and spots near claval suture. Corium basally bright orange deepening to red orange distally with a longitudinal wavy pink band terminating in inner anteapical cell. Terminal portion of band bordered with dark brown. Apical portions of tegmina pale fumose hyaline with whitish areas, veins red bearing dark brown circular spots. Three narrow evanescent brown stripes, one through outer apical cell from costal margin, another along front margin of outer apical cell from costal margin, and third anterior to outer apical cell. Scattered areas of waxy bloom on tegmina.

Male genital structures.—See Plate II, figs. D1, D2, and D3. Pygofer process long slender, somewhat irregular, slightly decurved with sharply bifurcate apex. Aedeagus in lateral view short stout, the shaft narrowed but little with apex rounded.

HOLOTYPE Male, Trinidad River, Panama, May 6, 1911, August Busck. U.S.N.M. type number 64099. Female unknown.

The bifurcate pygofer process separates this species from all others in the genus.

Chinaia caprella new species

Length.—Male 5.5 mm.

Coloration.—Venter, legs, face, vertex, antennae, pronotum, scutellum as in *bifurcata*. Clavus basally yellow with faint greenish cast separated by dark brown oblique stripe from apical three-eighths which is orange with few dark spots. Corium yellow with three indistinct broad oblique orange bands, dark margined wavy pink band limited to distal portion. Orange bands fused to form a stripe along claval suture. Apical portions of tegmina with veins dull yellow, membrane fumose orange hyaline with dark spots. Three evanescent narrow brown stripes as in *bifurcata*. Waxy bloom on central area of costal margin.

Male genital structures.—See Plate II, figs. E1, E2, E3. Pygofer process "S" shaped. Aedeagus in lateral view long, stout basally, tapering to a sharp upturned tip.

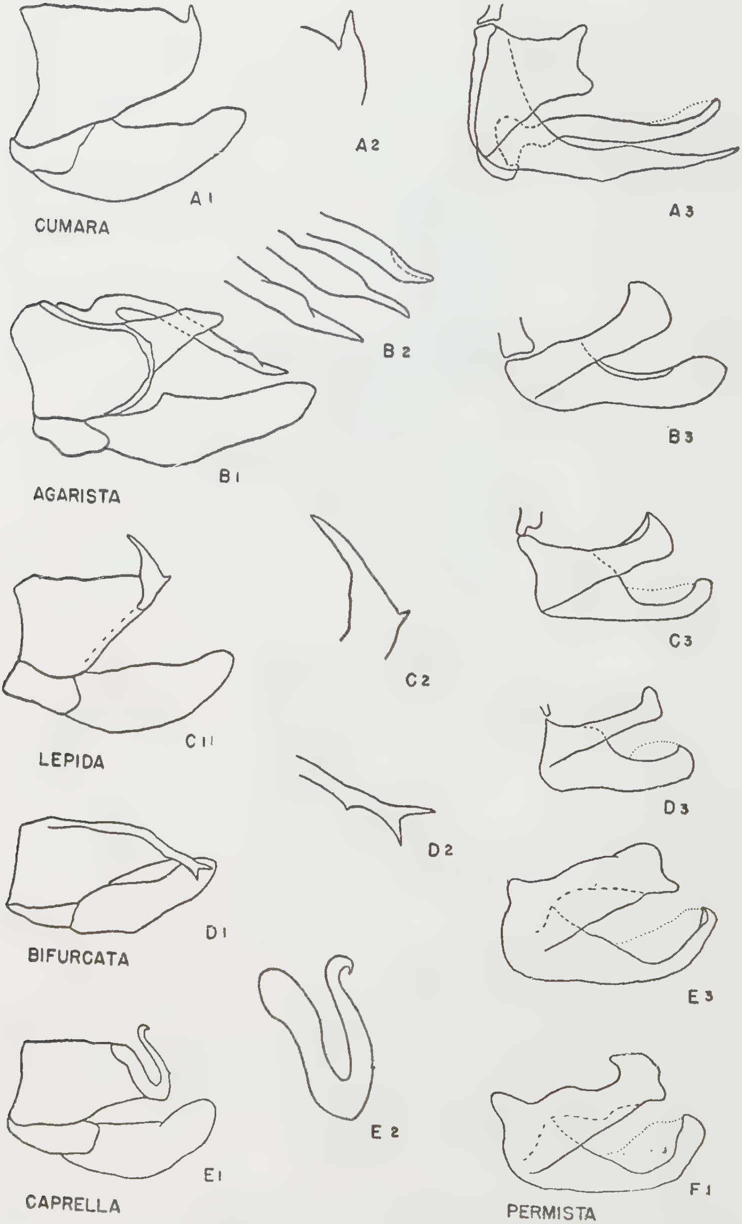
HOLOTYPE Male, Panama Swamp (near Colón), Panama, Nov. 20, 1951, F. S. Blanton. U.S.N.M. type number 64100. Female unknown.

The "S" shaped pygofer process will separate *caprella* from all others but *permista*. The lack of an orange stripe on the anterior portion of the clavus will distinguish *caprella* from *permista*.

Chinaia permista new species

Length.—Male 5.3 mm.

Coloration.—Venter and legs as in *caprella*. Face, vertex, antennae tending toward dull orange. Pronotum and scutellum as in *caprella*. Clavus, proximal portion pale yellowish white with irregular medially


A 1
CUMARA
A 2
A 3
B 2
B 1
AGARISTA
B 3
C 2
C 3
C 11
LEPIDA
D 3
D 2
D 1
BIFURCATA
E 3
E 2
E 1
CAPRELLA
F 1
PERMISTA

located orange stripe from anterior border to commissural margin, distal three-eighths orange separated by oblique brown stripe. Corium marked as in *caprella* with three oblique orange bands, first and third of which are broken, on pale yellowish white. Pink stripe absent. Rest of tegmina like *caprella.*

Male genital structures.—See Plate II, fig. F1. Pygofer process as in *caprella.* Aedeagus in lateral view like *caprella* except slightly heavier and lateral flaps of a different shape.

HOLOTYPE Male, Panama Summit (16 km. N.W. of Balboa), Canal Zone, January, 1947, N. L. H. Krauss. U.S.N.M. type number 64101. Paratype male, Madden Dam (35 km. S.E. of Colón), Canal Zone, April 28, 1952, F. S. Blanton. Female unknown.

Close to *caprella* but appears paler and with differences in aedeagus and orange stripe on anterior portion of clavus. However, additional material may show that the characters here interpreted as distinguishing *caprella* and *permista* intergrade. If so, in the absence of evidence of reproductive isolation, *permista* should be suppressed as a synonym.

Chinaia cumara new species

Length.—Male 5.8 mm.

Coloration.—Venter, legs, face, vertex, antennae as in *bifurcata.* Pronotum pale yellowish white with very wide red orange lateral and posterior margins. Scutellum as in bifurcata. Clavus, anterior half, pale yellow with a greenish cast and pale border; posterior half orange separated by a dark brown oblique stripe, three small brown spots along commissural margin. Corium orange with vague pink stripe bordered distally by dark brown. Three evanescent brown stripes as in *bifurcata.* Apices of tegmina fumose hyaline, veins orange bearing brown spots. Waxy bloom on central area of costal margin.

Male genital structures.—See Plate II, figs. A1, A2, and A3. Terminus of pygofer short upturned and somewhat fingerlike. Aedeagus in lateral view very slender, slightly reflexed toward tip and flanked by a long sharp process on each side. Only one of these processes is shown in the drawing.

HOLOTYPE Male, Trece Aguas (vicinity of Cacao), Alta Verapaz, Guatemala, April 14, 1906, Barber and Schwarz. U.S.N.M. type number 64102. Female unknown.

The short terminus of the pygofer and paired processes which flank the aedeagus are distinctive.

Because the components of the genital capsule depart quite markedly in form from the other new species, *cumara* may represent a distinct genus. However, a conservative treatment places *cumara* in *Chinaia.*

Chinaia lepida new species

Length.—Male 5.3 mm.

Coloration.—Venter, legs, face, vertex, antennae, pronotum, scutellum is in *bifurcata.* Clavus as in *caprella.* Corium orange with indistinct wavy pink stripe bordered distally by dark brown. Three narrow evanescent brown stripes as in *bifurcata.* Apical portions of tegmina pale fumose hyaline with veins concolorous and difficult to discern. Veins bearing dark brown spots.

Male genital structures.—See Plate II, figs. C1, C2, and C3. Pygofer process subtriangular. Aedeagus in lateral view similar to *bifurcata* but shaft narrower and dorsal portion of base attenuated.

HOLOTYPE Male, Fort Gulick (4.5 km. S. of Colón), Canal Zone, Dec. 18, 1956, taken in light trap. U.S.N.M. type number 64103. Female unknown. Plate I illustrates *lepida.* The subtriangular pygofer process is distinctive.

Chinaia agarista new species

Length.—Males 5.6 mm. to 6.2 mm.; holotype 5.9 mm.

Coloration.—Venter, legs, face, vertex, antennae, pronotum, clavus, corium, and apical portions of tegmina as in *lepida.* Basal half of scutellum yellow, apical half orange. One paratype with scutellum colored as in *bifurcata.*

Male genital structures.—See Plate II, figs. B1, B2, and B3. Pygofer process long and spearlike, decurved with variations in apex as noted in drawings. Variations appear with rotation. Aedeagus in lateral view with basal part and tip rather bulbous and shaft narrowed.

HOLOTYPE Male, David, Panama, Dec. 13, 1952, F. S. Blanton. U.S.N.M. type number 64104. Paratypes, 2 males: David, Panama, Dec. 14, 1952, F. S. Blanton; Aguadulce, Panama, Nov. 21, 1952, F. S. Blanton. Female unknown.

The spearlike pygofer process is distinctive.

The following list includes all species described in or assigned to *Chinaia.* A revision may indicate generic misplacement of some of these species.

Check-list of species of *Chinaia*

1. *agarista* Kramer 1958—Panama
2. *bella* Bruner and Metcalf 1934—Costa Rica
3. *bifurcata* Kramer 1958—Panama
4. *caprella* Kramer 1958—Panama
5. *citrina* Evans 1947—British Guiana
6. *cumara* Kramer 1958—Guatemala
7. *lepida* Kramer 1958—Canal Zone
8. *ornata* (Osborn) 1924 [Neocoelidia]—Colombia
9. *permista* Kramer 1958—Canal Zone
10. *punctata* (Osborn) 1923 [Neocoelidial]—Bolivia
11. *rlbescens* (Fowler) 1909 [Tettigonia]—Panama
12. *smithii*(Baker) 1898 [Neocoelidia]—Brazil
13. *undata* Linnavuori 1956—Brazil

Plate I. *Chinaia lepida* new species, male

Plate II. Explanation of figures A-F. Parts of male genital structures:
1. lateral view of pygofer, valve, and male plate;
2. enlarged pygofer process;
3. lateral view of aedeagus.

Note: series 1 drawn at 60x, series 2 at 120x, and series 3 at 120x. All drawings made with aid of camera lucida.

Vol. 71, pp. 75-80 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW APHIDS FROM *PINUS CONTORTA*

By F. C. Hottes

The new species described herewith are allied to a third species *Cinara brevispinosa* G & P and are likely to have been taken for it.

Cinara contortae n. sp.

Apterous viviparous female.

Length from vertex to end of cauda varying from 2.55-3.15mm. Color notes from living specimens not available. Color as presented by cleared mounted specimens as follows: Head and thorax pale brown, cornicles brown, femora pale at the base with remainder brown, tibiae brown with pale band on basal half of segment.

Head and thorax. Antennal segments one and two concolorous with head, antennal segments III, IV and V pale with apical regions brownish. Sixth antennal segment brown, distinctly imbricated, marginal sensoria in a row, with wide rims, close to primary. Sensoria distributed as follows: III none or with primary, IV with only primary sensorium, V with primary and one secondary sensoria, or with secondary sensorium absent. Hairs on third antennal segment sparse, coarse, spinelike, shorter than width of segment, set at an angle of about forty-five degrees. Hairs on fifth antennal segment numerous about equal to width of segment in length, less spinelike than hairs on third segment. Vertex of head with hairs varying in length from .045-.06mm. coarse, spinelike. Dorsum of head with few hairs, they being similar to those on vertex. Ocular tubercles present, but small. Last three segments of the rostrum with the following lengths: .18, .17 and .08mm. when extended the rostrum reaching to just beyond cornicles. Prothoracic femora varying from .75-.78mm. Prothoracic tibiae varying from 1.14-1.20mm. Metathoracic femora 1.12mm. Metathoracic tibiae 1.90mm. Metathoracic tarsal segments .09 and .23mm. long. Hairs on pale basal portion of metathoracic femora very fine and about .07mm. in length, remaining hairs about .04mm. in length, and distinctly spinelike. Hairs on outer margin of metathoracic tibiae varying in length from .03-.05mm. distinctly spinelike, spaced not much if any closer than their length, with the longest hairs on the apical fourth of segment. On the basal half of segment the hairs on the outer margin of the metathoracic tibaie are set at an angle of about forty-five degrees, the longer hairs near the apex are set at a lesser angle. Hairs on the inner margin of the metathoracic tibiae fine, on apical fourth of this margin distinctly more numerous. Ventral surface of the first metatarsal segment with about ten hairs. Union of first and second metatarsal segments longer than width of second segment at junction. Hairs on ventral surface of second metatarsal segment about as long as hairs on dorsal surface, but distinctly more numerous. Mesosternal tubercle present, but so poorly developed that it has to be looked for. Pigmented areas on the dorsum of the thorax with few hairs similar to those on the dorsum of the head.

Abdomen.—Dorsum of abdomen with a few small scattered pigmented spots which vary in shape and size, the most consistent and largest being just anterior to the pigmented spots anterior to the cauda. Hairs on dorsum of abdomen quite similar to those on the dorsum of the head, increasing slightly in length from front to rear of abdomen, few in number. Hairs on ventral surface of abdomen numerous, fine, long. Dorsum of abdomen very finely retriculated, the reticulations being larger towards the rear, here they are also indicated by setulae. Pigmented areas anterior to cauda with a row of long fine hairs along the posterior margin.

Cornicles varying in width at the outer margin from .33-.40mm. Hairs on cornicles sparse, those on cone about .08mm. in length fine. Outer surface of cornicles with very few hairs, at the most four or five, and these distinctly spinelike, and much shorter than the hairs on the cone. Outer margin of cornicles irregular, but not distinctly so. Cauda and anal plate with black setulae, both provided with long fine hairs. Hairs on genital plate few, confined largely to ends.

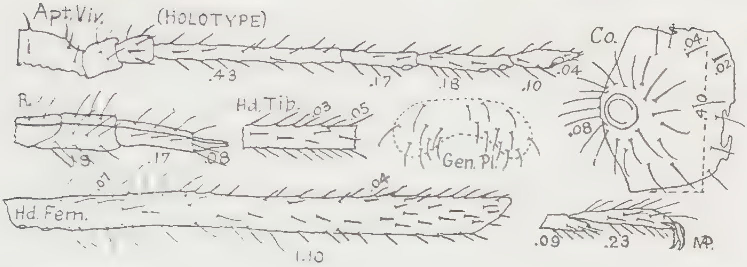
Holotype apterous viviparous female, deposited in the collection of E. O. Essig. Data associated with holotype: *Pinus contorta,* Upper Echo Lake, California, Alt. 7500 ft. Aug. 6, 1937. Collected by E. O. Essig.

This species may be differentiated from *C. brevispinosa* G. & P. by the absence of transverse pigmented areas on the dorsum of the abdomen, and by the irregular arrangement of hairs on the dorsum, and by the arrangement and character of hairs on the cornicles. From *C. banksiana* P. & T. this species differs by having fewer hairs on the pigmented dorsal portion of the thorax, fewer hairs on the metathoracic tibiae, which are also shorter, and by having the hairs on the inner surface of the metathoracic tibiae unlike those on the outer surface, and by fewer hairs on the cornicles.

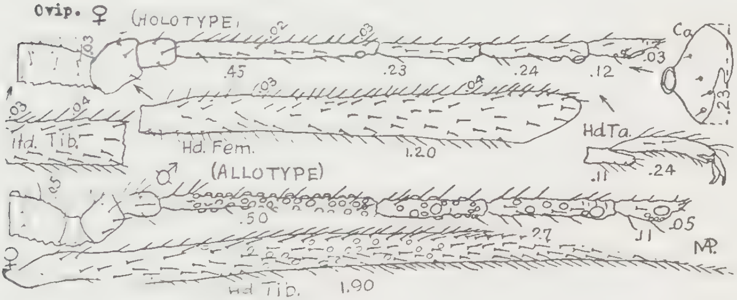
Cinara parvicornis n. sp.

Oviparous female.

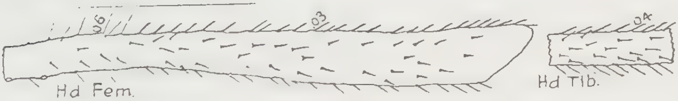
Length from vertex to end of anal plate varying from 2.47-3.15mm. Color in life not recorded. Color as represented by cleared mounted specimens as follows: head and thorax brown shaded with dusky, the pigmented areas of the dorsum of the thorax somewhat darker than the head. First antennal segment concolorous with head. Second antennal segment pale dusky, not as dark as the first segment. Antennal segments three, four and five pale with the apical portions dusky, the dusky area of the fifth segment being the most extensive. Sixth antennal segment uniform brown. Pro and mesothoracic femora shading from light dusky at the base to brown at apex. Metathoracic femora pale dusky on basal half shading quickly to brownish black. Pro and



Cinara contortae n.sp.



Cinara parvicornis n.sp.



Cinara brevispinosa (G & P)

mesothoracic tibiae with short regions at the base and apex dusky brown area between pale. Metathoracic tibiae with a short area near the base brown, this followed by a short paler area which quickly shades into deep brownish black. Except for the usual wax pore plates the dorsum has no pigmented spots, apparently even the pigmented spots anterior to the cauda are lacking. Cornicles dusky with the constricted area darker than the margin.

Head and thorax.—Antennal segments with the following lengths: III .36-.45mm., IV .16-.22mm., as a rule .22mm., V .18-.24mm., VI .09-.12 + .03mm. As a rule the primary sensorium on the third antennal segment is lacking, as are secondary sensoria. The fourth antennal segment has the primary sensorium present, the fifth antennal segment has the primary sensorium present and one secondary sensorium. The primary sensorium of the fifth antennal segment is quite tuberculate. The hairs on the antennal segments are sparse, and short, those on the third segment vary in length from .02-.03mm. and are somewhat spinelike. The hairs on the fourth and fifth antennal segments are less spinelike than those on the third. The hairs on the sixth antennal segment are very sparse, and fine, however they are no longer than those on the third. The apex of the fifth and all of the sixth antennal segments are imbricated. The marginal sensoria on the sixth antennal segment are in a double row, they have wide rims. The hairs on the vertex of the head and those on the dorsum are sparse, slightly longer and more spinelike than those on the antennae. The ocular tubercles are small. The rostrum when extended fails to reach the cornicles by about the length of the last three segments, which have a length as follows: .18, .19, .07mm. The prothoracic femora vary in length from .65-.75mm., the tibiae of the same vary from .90-.99mm. The metathoracic femora vary from 1.08-1.20mm., the tibiae of the same vary from 1.80-2.10mm. The hairs on the pro and mesothoracic femora are fine and comparatively short, the hairs on the metathoracic femora vary from .03-.04mm. in length, they are definitely shorter and more spinelike than the hairs on the femora of the pro and mesothorax, the more heavy spinelike hairs being towards the apex. The hairs on the metathoracic tibiae are similar on the outer and inner margins, they are only somewhat spinelike, and definitely shorter than one half the width of the tibiae. The hairs towards the apex of the segment are slightly longer and more droopy than the hairs closer to the base, they [illegible] margin of the tibiae the hairs are also slightly [illegible] in length, quite sparse near the base where they are spaced further apart than their length, towards the end of this segment the hairs increase in number. The first metatarsal segment has about twelve hairs on its ventral surface, it is about .11mm. long. The second metatarsal segment is from .23-.24mm. long, the hairs on its ventral surface are extremely short, much shorter than the hairs on the dorsal surface. The union of the first and second metatarsal segments is no wider than the width of the second segment at the base.

Abdomen.—The dorsum of the abdomen is extremely finely reticulated. The hairs on the dorsum of the abdomen are very sparse, fine and short, ranging in length from just long enough to be present to .03mm., with most of the hairs not much longer than .015mm. Most of the hairs arise from a small pale area which in turn is within a small brownish band. The outer margin of the cornicles measures about .18-.19mm. it is quite irregular. The hairs on the cornicles are very sparse, and are no more numerous on the raised area than on the margin, in length they range from very short to about .015mm. Cauda and anal plate with setulae, both with long fine hairs. Genital plate large, slightly concave on anterior and posterior surfaces, well provided with fine hairs which cover all of the surface.

Alate male.—Length from vertex to end of anal plate 2.10mm. Length of antennal segments as follows: III .46-.50mm., IV .24-.25mm., V .24-.28mm., VI .11+ .05mm. Sensoria distributed as follows: III 61-68, IV 13-17, V 6-9. The sensoria on all antennal segments show considerable variation in size. Hairs on antennae short, much shorter than width of segment, sparse, fine. All of sixth antennal segment and most of fifth with well developed imbrications. Media twice branched, with the second fork much closer to the margin of the wing than to the first. Area of wing beneath costal margin dark dusky. Hairs on metathoracic tibiae much longer than the hairs on the tibiae of the oviparous female, fine, similar on outer and inner margins, more droopy and more numerous towards the apex. Hairs on anterior margin of metathoracic femora near apex long and fine, hairs on the posterior margin in this region short and spinelike, hairs on both margins near base fine, much sparser than hairs near apex. Cornicles about .18mm. across the outer margin, more extensive than the cornicles of the oviparous female, and with more hairs, but with the hairs sparse. Restricted area of the cornicles higher than is the case in the oviparous females and acentric, being closer to the posterior margin. Pigmented spots anterior to cauda unequal in size, with a row of hairs on the posterior margin. Genital plate elongated, narrow, slightly concave on anterior and posterior surfaces. Hairs on genital plate numerous and covering entire surface. Anterior to the genital plate there is a pigmented band which is also covered with hairs. Hairs on the gonapophyses short and fine, inner margins of the gonapophyses elongated, quite finger like. Holotype, oviparous female, allotype alate male, both deposited in the United States National Museum. Host, *Pinus contorta* (lodgepole pine). Flathead, Montana. Sept. 21, 1955. Collected by David McComb.

In Palmer's key to the genus *Cinara* in Aphids of the Rocky Mountain Region, this species would most likely be keyed to *C. atra* (G&P), but not without question, and a species with which it has little in common. Because of the short hairs on the tibiae and similar host it is most likely to be taken for *C. brevispinosa* (G&P). When *brevispinosa* was described the presence of pigmented bands, provided with a few very short spinelike hairs on the dorsum of the abdomen was not recorded, possibly because no specimens were cleared, these bands are lacking in *parvicornis.* The cornicles of *parvicornis* in the oviparous female are very distinctive, the cornicles of the viviparous females should be similar, and should in themselves be enough to distinguish this species from other species on *Pinus contorta* as well as other species within the genus.

Vol. 71, pp. 81-84 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF *CINARA* FROM MICHIGAN (APHIDAE)

By F. C. Hottes

The material from which this new species was described was sent me by Miss Louise M. Russell of the Entomology Research Division, United States Department of Agriculture.

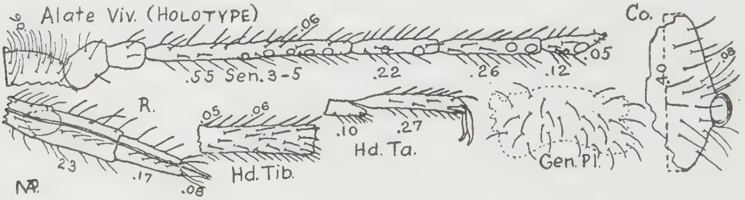
Cinara kocheta n. sp.

Alate viviparous female.

Length from vertex to end of cauda varying from 2.55-2.85mm. Color in life not recorded, as represented by cleared mounted specimens as follows: Head and thorax very dark dusky brown, both in life most likely black. Abdomen light dusky brown, cornicles much darker. First and second antennal segments concolorous with head, or slightly darker, third, fourth and fifth segments with basal regions dusky, remainder of segments much darker, sixth segment uniform dark brown. Median suture of head black. All femora very dark brown. Pro and mesothoracic tibiae with short region near base brown, this followed by a pale region, which shades into brown at the apex. Metathoracic tibiae almost uniform deep brownish black, but sometimes with just a suggestion of a lighter area on basal half. Tarsal segments concolorous with ends of tibiae.

Head and thorax.—Length of antennal segments as follows: III .52-.55mm., IV .21-.27mm., V .22-.27mm, VI .12 + .05mm. Secondary sensoria distributed as follows: III 2-4, IV 0-1, V 1-2. The secondary sensoria on the third segment are arranged in a straight row, they show much variation in size and position, the primary sensorium on this segment is much like the secondary. The remaining antennal segments have large primary sensoria with wide rims. The sixth antennal segment is weakly imbricated, the marginal sensoria on this segment are of two sizes and are grouped. The hair on the antennae are rather sparse, on the third segment they are about .06mm. in length, set at an angle of about forty five degrees, they are more numerous on the anterior margin. Ocular tubercles well developed. Hairs on vertex and dorsum of head numerous, fine, sharp pointed, about .06mm. in length. Rostrum in one case almost as long as the body, as a rule reaching the cornicles. Hairs on lateral lobes of thorax covering median half of lobe, long and fine, posterior median lobe of thorax with hairs on central portion of lobe. Media twice forked, second fork closer to margin of wing than to first. Last three segments of the rostrum with the following lengths: .23, .17, .08mm. Prothoracic femora varying in length from .97-1.05mm., tibiae of same varying from 1.35-1.65mm. Metathoracic femora varying from 1.27-1.35mm., tibiae of same varying from 2.47-2.85mm. Length of first and second metatarsal segments .10 and .27mm. Hairs on femora fine, upstanding, hairs on anterior margin of metathoracic femora finer but about as long as the hairs on the anterior margin of the third antennal segment. Hairs on metathoracic tibiae rather spine like, sharp pointed, set at an angle of about forty five degrees, similar on both margins as to character but more numerous on the inner margin. On the outer margin the hairs vary in length from .05-.06mm. being considerably shorter than the width of segment. First metatarsal segment with about nine hairs on the ventral surface. Second metatarsal segment with the hairs on the dorsal and ventral surfaces about the same in length, but with the hairs on the ventral surface more numerous.

Abdomen.—Dorsum of abdomen with extremely few fine rather short hairs, hairs on the ventral surface abundant. Width of cornicles varying from .40-.52mm. The cornicles are rather shallow, with the outer margins irregular but not deeply indented in any one place. Opening of cornicles closer to posterior margin than to anterior. Hairs on cornicles sparse, hardly more numerous on constricted area than on margin. Pigmented areas anterior to cauda variable, sometimes united, sometimes divided, sometimes joined by teeth on the inner margins, always rather narrow, with a single row of hairs along the posterior margin. Hairs on cauda confined to posterior margin, both cauda and anal plate with setulose surface. Genital plate concave on posterior surface, with hairs over most of surface.



Cinara kocheta n.sp.

This species is closely allied to *C. banksiana* P. & T. but differs from that species as follows: more numerous, finer and sharper hairs on the head. Smaller more brown cornicles, shorter hairs on the tibiae, more numerous hairs on the first and second antennal segments, fewer hairs on the dorsum of the abdomen, and the imbrications on the sixth antennal segment being more poorly developed.

From *Cinara nigra* (Wilson), this species would appear to differ as follows: much larger base of cornicle, in *nigra* Wilson records the base of cornicle as being much smaller than the base of the cornicle in the apterous viviparous female. Prof. Palmer's drawings of these structures from the type slide indicates the base of the cornicles in the alate of *nigra* as .19mm. and in the case of the apterous viviparous female as .33mm. The antennal segments of *C. kocheta* are longer, and the secondary sensoria fewer than in *C. nigra* (Wilson).

Host, *Pinus banksiana* (Jack pine) Iron River, Michigan July 6, 1951. Collected by D. M. Benjamin. Collected on terminal branches. Holotype alate viviparous female, deposited in the United States National Museum.

Vol. 71, pp. 85-86 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF *CINARA* FROM IDAHO (APPHIDAE)

By F. C. Hottes

I am indebted to Prof. Carl Johansen of Pullman, Washington for sending me the material from which this new species is described.

Cinara kuchea n. sp.

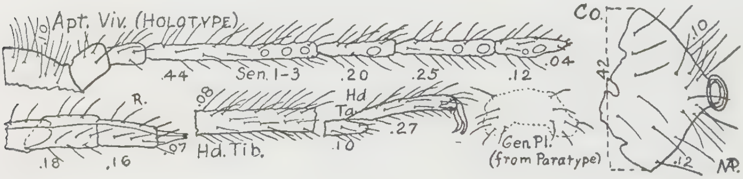
Apterous viviparous female.

Length from vertex to end of cauda varying from 2.28-2.62mm. Color not recorded from living specimens, as represented by mounted cleared specimens as follows: Head pale dusky brown. Prothorax concolorous with head, meso and metathorax similar to prothorax but the color is broken and irregular. Abdomen as cleared pale, cornicles blackish. Pigmented areas anterior to cauda very large very close together, and sometimes almost united by teeth on their inner margins, anterior to these there are a few scattered irregular spots which vary in size, the most posterior being largest and the most consistent. None of the smaller pigmented spots extend forward of the posterior margin of the cornicles. Antennal segments I and II concolorous with head, third antennal segment pale except for the extreme apex, fourth and fifth antennal segments with basal half pale remainder pale dusky. Sixth antennal segment pale dusky throughout. Femora pale at base shading gradually to light brownish tan. Pro and mesothoracic tibiae pale except for short brownish areas at base and apex, the brown at the apex being no longer than the tarsal segments. Metathoracic tibiae similar to mesothoracic tibiae except that the pale area extends only to the middle of segment. Tarsal segments concolorous with ends of tibiae.

Head and thorax.—Antennal segments varying in length as follows: III .31-.49mm., IV .16-.20mm., V .21-.25mm., VI .11-.12 + .03mm. Sensoria distributed as follows: III 0-4 secondary, most common number 1-2. IV 1-2 as a rule one, V 1. The primary sensorium of the fifth segment is much larger than the primary sensoria on the third and fourth segments, it has a wide rim. Marginal sensoria on the sixth segment bunched at side of primary, they have wide rims, the primary sensorium on this segment is larger than other primary sensoria. Hairs on antennal segments fairly numerous, quite upstanding, on third segment about .075mm. in length, more numerous on anterior margin.

Sixth antennal segment lightly imbricated beyond the middle. Hairs on vertex and dorsum of head about .10mm. in length, fine. Ocular tubercles well developed. Rostrum extending to anterior margin of cornicles, last three segments with the following lengths: .18, .16, .07mm. the second segment of the rostrum is spotted, for most of its length. Median transverse suture of head well developed, dark. Lengths of pro and metathoracic femora varying as follows: .70-.93, 1.05-1.27mm. Lengths of pro and metathoracic tibiae varying as follows: 1.05-1.23, 1.83-2.22mm. Lengths of first and second metatarsal segments .10-.12, .27-.28mm. All femora with numerous long fine hairs, the hairs on the anterior margin of the metathoracic femora being longest. Hairs on metathoracic tibiae numerous, long, fine, sharp pointed, set at an angle of about forty five degrees. Hairs on inner margin of metathoracic tibiae more numerous and slightly shorter than the hairs on the outer margin, where the hairs vary in length from .05-.06mm. First metatarsal segment with about eleven hairs on the ventral surface. Mesosternal tubercle well developed, about as wide as long, but sometimes difficult to differentiate.

Abdomen.—Hairs on dorsum of abdomen not sparse, but hardly numerous, for the most part spaced but little closer than their length, ventral hairs numerous, shorter and finer than the hairs on the dorsum. Width of cornicles varying from .30-.40mm. shallow, outer margin irregular, hairs on cornicles not numerous, similar to those on the dorsum of the abdomen, very sparse on outer half. Hairs on transverse pigmented spots anterior to cauda roughly arranged in two rows, with the more anterior row with fewer hairs. Genital plate rather deeply excavated along posterior margin, the hairs confined largely to the ends and very few in number. Cauda with the hairs on the dorsum confined largely to the posterior margin. Both cauda and anal plate with a setulose surface.



Cinara kuchea n.sp.

This species may be differentiated from *C. hirsuta* H. & E. by its smaller size, shorter and fewer hairs on the antennae and tibiae, fewer hairs on femora, extent and shape of cornicles, fewer hairs on pigmented spots anterior to cauda.

Host, Pinus monticola (western white pine) Priest Lake, Idaho, Aug. 28, 1956. Sent for determination by Prof. Carl Johansen of State College of Washington, and probably collected by him.

Holotype apterous viviparous female, deposited in the United States National Museum.

Vol. 71, pp. 87-90 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF *CINARA* FROM WASHINGTON (APHIDAE)

By F. C. Hottes

I am indebted to Prof. E. O. Essig for sending me the material from which this new species is described.

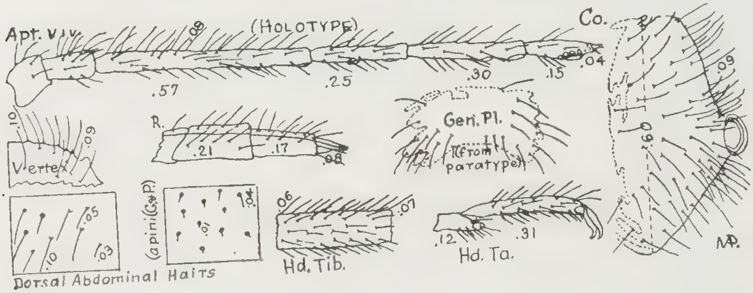
Cinara hirticula n. sp.

Apterous viviparous female.

Length from vertex to end of cauda varying from 3.65-3.80mm. Color notes taken from living specimens not available, as represented by cleared mounted specimens as follows: head and thorax dark dusky, in life most likely black. Cornicles two toned with the darker area adjacent to the orifice, both areas dusky black. Dorsum of abdomen posterior to cornicles with or without irregularly shaped pigmented spots of varying size. First antennal segment concolorous with head, second antennal segment slightly lighter than the first. Third, fourth and fifth antennal segments pale dusky with the extreme apical regions darker, the darker area of the fifth segment being the most extensive. Sixth antennal segment almost uniform dark dusky. Femora with basal areas pale, shading to dark dusky, with the anterior margin and apex much the darkest, the pale area most extensive on the metathoracic femora. All tibiae with a very short area near the base black, prothoracic and mesothoracic tibiae with dusky following the black at the base, and this followed by dark dusky at the apex. Metathoracic tibiae with basal area followed by pale dusky to middle of segment, from here shading quickly to dark dusky black. Second segment of rostrum with pale dusky spots, remaining segments of the rostrum dark brown.

Head and thorax.—Length of antennal segments as follows: III .52-.57mm., IV .22-.25mm., V .21-.30mm., VI .15 + .04mm. Sensoria distributed as follows: III with only primary sensorium, IV, O-I secondary plus primary, V, I secondary plus primary. Hair on antennae numerous, on third segment more abundant and longer on anterior margin, set at angle of about sixty degrees, about .08mm. long. Sixth antennal segment weakly imbricated. Rostrum reaching orifice of cornicle. Last three segments of the rostrum with the following lengths: .21, .17, .08mm. Ocular tubercles small but very protuberant. Median transverse suture of head narrow but very distinct. Hairs on dorsum of head numerous, about .10mm. in length. Mesosternal tubercle present with the width greater than the length. Length of prothoracic femora and tibiae varying as follows: .97-1.08mm., 1.35-1.38mm. Length of metathoracic femora and tibiae varying as follows: 1.50-1.72mm., 2.40-2.77mm. Hairs on metathoracic femora numerous, more numerous towards apex, and along anterior margin, where the hairs are also longest. Hairs on metathoracic tibiae numerous, more numerous on outer margin than on inner margin, also more numerous towards the apex of segment. The hairs are spaced closer together than their length, set at an angle of about forty-five degrees, the apical half of each hair is finer than the basal half. On the outer margin the hairs vary from .06-.07mm. in length, being slightly shorter than the width of segment, the ratio of length to width being .06-.07 to .09mm. The segments of the metatarsus measure .12 and .03-.31mm. The ventral surface of the first metatarsal segment has about fourteen hairs, on this surface the two apical hairs arise at an angle to each other and are shorter and thicker than the others. The hairs on the ventral surface of the second metatarsal segment are more numerous and shorter than the hairs on the dorsal surface.

Abdomen.—Width of base of cornicles varying from .60-.67mm. The outer margin of the cornicles is very irregular, the posterior margin is associated with a few small free pigmented spots. The darker more constricted region of the cornicles has more hairs than the outer area. The hairs on the cornicles are about .09mm. in length. The dorsum of the abdomen has fairly numerous long fine hairs which vary in length from .09-.13mm. for the most part, but there are a few hairs as short as .05mm. These hairs are closer together than their length. Hairs on the ventral surface of the abdomen much more numerous than the hairs on the dorsal surface but of about the same length. Dorsum of the abdomen very finely reticulated. Ventral surface of the abdomen with transverse rows of setulae, similar rows of setulae are present on the dorsum on the larger pigmented areas, when such are present. Transverse pigmented spots anterior to the cauda wide, more or less joined on their inner margins by teeth, or free. Posterior portion of these spots with about three rows of long stiff hairs. Genital plate varying much in size, with the lateral portions toothed, the hairs few and confined largely to the ends and posterior margin. Cauda and anal plate with black coarse setulae. Hairs on cauda few, these and the hairs on the anal plate are about .15mm. in length.



Cinara hirticula n.sp.

This species is perhaps most closely allied to *C. apini* G. & P. It was so determined when sent to me. It differs from *apini* by the much longer coarser hairs on the dorsum of the abdomen, by longer tibial hairs, shorter and wider mesosternal tubercle, and by the distribution of hairs on the cornicles. In Paumer's key to the genus *Cinara* in, Aphids of the Rocky Mountain Region, this species keys to *C. apini* without difficulty. Strangely enough cleared specimens of *apini* do not key to *apini* in Palmer's key because of the short hairs on the dorsum of the abdomen, this fact not being known when the key was constructed, because the original material was not cleared. *C. apini* keys to the same section as *C. atra,* and differs in the longer antennae, larger cornicles, and shorter hairs on the ventral surface of the first metatarsal segment, as well as longer hairs on the antennae and tibiae. From *C. hirsuta* H. & E. this species differs in having much shorter body, femoral and tibial hairs, as well as shorter antennae. From *C. moketa* H. described from the same host, this species differs in the much longer antennal segments, much shorter tibial hairs, and the shorter hairs on the cornicles.

Holtype apterous viviparous female, returned to the collection of prof. E. O. Essig. Taken on *Pinus lambertiana,* Seattle, Washington June 21, 1955. Collected by M. J. Forsell.

Vol. 71, pp. 91-94 July 16, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE SCAPHOPOD MOLLUSKS: RECTIFICATIONS OF NOMENCLATURE II[1]

BY WILLIAM K. EMERSON
American Museum of Natural History

In the course of studying the Tertiary scaphopods of western North America, certain nomenclatural problems were encountered which require rectification. The purpose of this paper is to correct the present nomenclatural misconceptions concerning the scaphopod material described by Timothy A. Conrad as "*Teredo substriata,*" in 1849. Although subsequently Conrad (1865) questionably referred his material to the scaphopod genus *Dentalium,* he was not aware that this combination was preoccupied by *Dentalium substriatum* Deshayes, 1825.

As Dall (1909) pointed out, Conrad's taxon not only was a homonym, but the original material consisted of two valid species. Dall renamed the longitudinally striated specimens *Dentalium conradi* and the smooth ones *Dentalium petricola.* Unfortunately, Dall was not cognizant of the prior proposal by Pilsbry and Sharp (1898) of *Dentalium pseudonyma* to replace Conrad's homonym. Pilsbry and Sharp, moreover, failed to recognize the composite nature of Conrad's type material.

Inasmuch as the smooth specimens were not mentioned by Conrad (1850) in the brief original description, it appears advisable to restrict *Dentalium pseudonyma* to the finely striated species (Conrad's figure 7a) and retain *Dentalium petricola* Dall (1909) for the smooth species (Conrad's figures 7 and 7b). Thus, *Dentalium conradi* Dall (1909) becomes a junior synonym of *Dentalium pseudonyma* Pilsbry and Sharp (1898).

Annotated synonomies for the two recognized species are given below.

Dentalium (Dentalium?) pseudonyma Pilsbry and Sharp, 1898.

Teredo substriata Conrad, 1849 [in part], *in* Dana, Geol. U. S. Explor. Exped. (Wilkes), Appex 1, pt. 3, p. 728, pl. 20, figs. 7, 7b, not fig. 7a. Not *Dentalium substriatum* Deshayes, 1825.

---

[1] The first number bearing this title appeared in vol. 67, pp. 183-188, August 5, 1954 of these Proceedings. Dr. J. W. Durham, Department of Paleontology, University of California, Berkeley, kindly read the manuscript.

Teredo substriata, Woodward, 1857, *in* Carpenter, Rept. Brit. Assoc. Adv. Sci. for 1856, p. 367.

Dentalium? substriatum (*Teredo,*), Conrad, 1865 [in part], Amer. Jour. Conch., vol. 1, pt. 2, p. 151, (reference to Conrad, 1849, fig. 7a only; fig. 7b not cited).

Dentalium substriatum, Gabb, 1868, Geol. Surv. Calif., Paleont., p. 115, (''Miocene, Astoria, Oregon'').

Dentalium pseudonyma Pilsbry and Sharp, 1898, [in part], Man. Conch., ser. 1, val. 17, p. 213, (''new name for *Teredo substriata* Conrad, 1850'' [*sic*], here restricted to Conrad's fig. 7a).

Dentalium substriatum, Arnold, 1908, Proc. U. S. Nat. Mus., vol. 34, no. 1617, pl. 33, fig. 16.

Dentalium substriatum, Arnold, 1909, *in* Branner, Newsom, and Arnold, U. S. Geol. Surv., Folio no. 163, fig. 22.

Dentalium conradi Dall, 1909, U. S. Geol. Surv. Prof. Pap. no. 59, p. 136, (new name for *Teredo substriatum* Conrad, 1849, in part, fig. 7a only).

Not *Dentalium substriatum,* Arnold, 1910, U. S. Geol. Surv. Bull. 398,

Dentalium substriatum, Anderson, 1911, Proc. Calif. Acad. Sci., ser. 4, p. 71, pl. 26, fig. 15, (''Tejon, Eocene, Coalingia district'').
vol. 3, p. 100.

Dentalium conradi (?), Clark, 1912, Univ. Calif. Publ. Geol., vol. 7, no. 4, p. 51.

Dentalium conradi, Arnold and Hannibal, 1913, Proc. Amer. Philos. Soc., vol. 52, no. 212, pp. 581, 583, 584, 588.

Dentalium conradi, Weaver, 1916a, Univ. Wash. Publ. Geol., vol. 1, no. 1, pp. 30, 32.

Dentalium conradi, Weaver, 1916b, Proc. Calif. Acad. Sci., ser. 4, vol. 6, no. 2, p. 37.

Dentalium conradi, Weaver, 1916c, Proc. Calif. Acad. Sci., ser. 4, vol. 6, no. 3, p. 51.

Dentalium conradi, Clark, 1918, Univ. Calif. Publ. Geol., vol. 11, no. 2, pp. 80, 91, 98, 190.

Dentalium cf. *conradi,* Wagner and Schilling, 1923, Univ. Calif. Publ. Geol., vol. 14, no. 6, p. 246.

Dentalium conradi, Etherington, 1931, Univ. Calif. Publ. Geol., vol. 20, no. 5, p. 48.

Dentalium conradi, Weaver, 1942, Univ. Wash. Publ. Geol., vol. 5, pt. 1, p. 267; pt. 3, pl. 100, fig. 20.

Dentalium conradi, Keen, 1943, Trans. San Diego Soc. Nat. Hist., vol. 10, no. 2, p. 37.

Dentalium conradi?, Durham, 1944, Univ. Calif. Publ. Geol., vol. 27, no. 5, pp. 125, 191.

Dentalium conradi, Keen and Bentson, 1944, Geol. Soc. Amer. Spec. Pap., no. 56, p. 123.

Dentalium conradi, Vokes, Norbisrath, and Snavely, 1949, U. S. Geol. Surv. Oil and Gas Invest. Prelim. map 88.

Original description of *Teredo substriata:* ''Nearly straight and evenly cylindrical, very slightly tapering. Surface minutely and very neatly striate longitudinally'' Conrad, 1849.

Type locality: ''Astoria, Oregon, Miocene.''

Type depository: U. S. National Museum 3481, in part.

Geologic range: Late Oligocene to ''Middle'' Miocene.

Occurrences: Washington, Blakeley formation, Oligocene (''Seattle formation,'' Arnold and Hannibal, 1913; ''***Echinophoria rex*** zone,'' Durham, 1944); Twin River formation, Oligocene-Miocene (Arnold and Hannibal, 1913); Astoria formation, Miocene (Etherington, 1931). Oregon, Astoria formation, Miocene (Weaver, 1942; Vokes Norbisrath and Snavely, 1949). California, Temblor formation, Miocene (''Kern River group,'' Anderson, 1911); Round Mountain Silt, Miocene (Keen, 1943); ''Monterey formation'' [Contra Costa County], Miocene (Clark, 1912); San Ramon formation [Contra Costa County], ''Oligocene'' [Miocene] (''San Lorenzo series,'' Clark, 1918); San Lorenzo formation, Oligocene (Arnold, 1908; 1909); Pleito formation, Oligocene (Wagner and Schilling, 1923).

Dentalium (*Rhabdus*) *petricola* Dall, 1909

Teredo substriata Conrad, 1849 [in part] in Dana, Geol. U. S. Explor. Exped. (Wilkes), Appex 1, pt. 3, p. 728, pl. 20, figs. 7, 7b, not fig. 7a. Not *Dentalium substriatum* Deshayes, 1825.

Dentalium? substriatum (*Teredo*,), Conrad 1865 [in part], Amer. Jour. Conch., vol. 1, pt. 2, p. 151, (reference to Conrad, 1849, fig. 7 only).

Dentalium petricola Dall, 1909, U. S. Geol. Surv. Prof. Pap. no. 59, p. 136, (new name for *Teredo substriatum* Conrad, 1849, in part, figs. 7, 7b only).

Dentalium petricola, Clark, 1912, Univ. Calif. Publ. Geol., vol. 7, no. 4, p. 51.

Dentalium petricolum [*sic*], Anderson and Martin, 1914, Proc. Calif. Acad. Sci., ser. 4, vol. 4, no. 3, p. 43.

Dentalium petricola, Clark, 1915, Univ. Calif. Publ. Geol., vol. 9, no. 2, p. 15.

Dentalium petricola, Clark, 1918, Univ. Calif. Publ. Geol., vol. 11, no. 2, pp. 80, 98, 190.

Dentalium rectius ''Cpr.'' Howe, 1922, Univ. Calif. Publ. Geol., vol. 14, no. 3, p. 94. Not *Dentalium rectius* Carpenter, 1865.

Dentalium petricolum, Loel and Corey, 1932, Univ. Calif. Publ. Geol., vol. 22, no. 3, p. 152.

Dentalium petricola, Weaver, 1942, Univ. Wash. Publ. Geol., vol. 5, pt. 1, p. 267.

Dentalium petricola, Keen, 1943, Trans. San Diego Soc. Nat. Hist., vol. 10, no. 2, p. 37.

Dentalium petricola, Durham, 1944, Univ. Calif. Publ. Geol. Sci., vol 27, no. 5, pp. 125, 191.

Dentalium petricola, Snavely and Vokes, 1949, U. S. Geol. Surv. Oil and Gas Invest. Prelim. map 97.

Dentalium petricola, Vokes, Norbisrath and Snavely, 1949, U. S. Geol. Surv. Oil and Gas Invest. Prelim. map 88.

Dentalium petricola, Weaver, 1949, Geol. Soc. Amer. Mem. 35, p. 66.

Dentalium petricola, Weaver, 1953, Univ. Wash. Publ. Geol., vol. 7, p. 60.

Type locality: ''Astoria, Oregon, Miocene.''

Type depository: Syntypes U. S. National Museum 3528 and 3481, in part.

Geologic range: Late Oligocene to ''Middle'' Pliocene.

Occurrences: Washington, Blakeley formation, Oligocene (''*Echinophoria rex* zone,'' Durham, 1944); Astoria formation, Miocene (Weaver, 1942). Oregon, Astoria formation, Miocene (Snavely and Vokes, 1949; Vokes, Norbisrath and Snavely, 1949); Empire formation, Pliocene (Howe 1922; Weaver, 1942). California, Temblor formation, Miocene (''Temblor horizon,'' Loel and Corey, 1932; ''Kern River district,'' Anderson and Martin, 1914); Round Mountain Silt, Miocene (Keen, 1943); ''Monterey formation'' [Contra Costa County], Miocene (Clark, 1912, 1915); San Ramon formation [Contra Costa County], ''Oligocene'' [Miocene] (''San Lorenzo series,'' Clark, 1918; ''San Ramon sandstone'' Weaver, 1949; ''San Ramon formation'' Weaver, 1953).

LITERATURE CITED

Conrad, T. A., *in* James D. Dana, 1849, United States Exploring Expedition during the years, 1838, 1839, 1840, 1841, 1842, under the command of Charles Wilkes, U.S.N., vol. 10, Geology, Appendix 1, part 3, Fossils from Northwestern America, pp. 722-728, pls. 16-20, Philadelphia.

————, 1865, Catalogue of the older Eocene shells of Oregon. Amer. Journ. Conch., vol. 1, pt. 2, pp. 150-154.

Dall, William Healey, 1909, Contributions to the Tertiary Paleontology of the Pacific Coast. I. The Miocene of Astoria and Coos Bay, Oregon. U. S. Geol. Surv. Prof. Paper 59, pp. 1-278, pls. 2-23, figs. 1-14, 13 append., Washington, D. C.

Emerson, William K., 1954, Notes on the Scaphopod Mollusks: Rectifications of Nomenclature I, Proc. Biol. Soc. Wash., vol. 67, pp. 183-188.

Pilsbry, Henry A. and B. Sharp, *in* George W. Tryon, Jr., 1897-1898, Manual of Conchology, ser. 1, vol. 17, Scaphopoda, Appendix A, Fossil Scaphopoda, pp. 197-240, [1898], Philadelphia.

Vol. 71, pp. 95-106 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A REVISION OF THE PHILIPPINE ELEGANT TITMOUSE (PARUS ELEGANS)

By Kenneth C. Parkes
Carnegie Museum, Pittsburgh, Pa.

The titmouse genus *Parus,* in the broad sense currently used, displays a marked tendency toward geographic variation, many if not most of the included species being divided into numerous subspecies. The resident birds of the Philippine archipelago exhibit a strong tendency to develop well-marked races from island to island. With these two tendencies reinforcing one another, it is not surprising to find that one of the most plastic bird species in the Philippines is the Elegant Titmouse (*Parus elegans*). Delacour and Mayr (1946: 217-218) listed no less than nine subspecies of this endemic Philippine species, with the caution that "several possibly are not valid."

Dr. David Snow, who is preparing the section on the family Paridae for the Peters "Check-list of Birds of the World," suggested that in connection with my current studies of Philippine birds I undertake a review of the races of *Parus elegans.* I have therefore assembled over 200 specimens, including six types. This unprecedented series represents virtually all of the existing specimens of *Parus elegans* in North American museums. As will be noted beyond, there are some serious gaps in the available material, but this cannot be remedied without further collecting which may not be done for many years to come. The most unfortunate lack is the series, including three type specimens, formerly housed in the Bureau of Science in Manila, destroyed by fire in 1945.

Specimens were borrowed for this study through the courtesy of the authorities of the following institutions: Academy of Natural Sciences of Philadelphia, American Museum of Natural History, British Museum (Natural History), Chicago Natural History Museum, Minnesota Museum of Natural History, Museum of Comparative Zoology, Museum of Vertebrate Zoology, Royal Ontario Museum of Zoology, United States National Museum, and Yale Peabody Museum. Dr. S. Dillon Ripley also allowed me to use the specimens from the Hachisuka Collection, now in his personal collection. For additional information through cor-

respondence I am indebted to David Snow, Canuto G. Manuel, and D. S. Rabor.

The Elegant Titmouse is the only species of its family to have reached a tropical archipelago. It is widely distributed in the Philippines, from the Babuyan Group in the north to the Sulu Archipelago in the south. Major islands from which the species does not seem to have been recorded include Basilan, Bohol, Catanduanes, Romblon, Sibuyan, Siquijor, and Tablas. Although McGregor (1920: 427) attributes this species to the Samar-Leyte group, I cannot find any records from either of these islands, and the absence of *Parus elegans* from Samar and Leyte is specifically mentioned by Delacour and Mayr (1946: 218). In Palawan *elegans* is replaced by a closely related species, *P. amabilis*; these two and the Chinese *P. venustulus* have sometimes been separated as a genus *Pardaliparus,* but this division is not currently recognized. The close relationship of these three species might best be expressed by considering them to represent a superspecies; they are almost certainly derived from the widely distributed palaearctic *Parus* (''*Periparus*'') *ater,* the Coal Tit.

Size in *Parus elegans* decreases, in general, from north to south. In most of the archipelago this change is rather gradual, but is somewhat more marked at both extremes. The difference in wing length between the largest and smallest males measured was only 11 millimeters, indicating the relative unimportance of size as a principal subspecific character. There is no such obvious cline in any color character throughout the archipelago, although certain groups of subspecies have common color differences from other groups. In general, the aspects of color and pattern which vary geographically, and which are used in subspecific diagnoses are: relative amounts of black, white, gray and yellow in dorsal area; relative intensity of yellow in yellow areas; size of white spots on wings; presence or absence of yellow edges or wash on white spots of wing and tail; size of nuchal spot. There is also some evidence of geographic variation in the amount of sexual dimorphism, but series of the critical races are too small, and the possibility of erroneously sexed specimens too great, to do more than call attention to this phenomenon in the discussions of the pertinent subspecies.

The number of subspecies of *Parus elegans* recognized in the present paper may seem excessive to anyone who has not examined the definitive series I have been able to assemble. I have synonymized two names used by earlier workers, and have erected two additional subspecies. I believe that any further suppression of races would not do justice to the facts; in fact, in the discussion og *P. e. mindanensis* evidence is presented to indicate the probable existence of still another race.

Parus elegans and its near relatives are unusual among the true titmice in possessing a definite sexual dimorphism in color as well as a minor size dimorphism. Descriptions of the various subspecies, beyond, will emphasize the plumage of the male. In general, females have all black areas duller and sometimes (throat) washed with yellow (but not ''dark brown'' as described by McGregor, 1909: 605). The white tips of wing coverts and tertials are smaller in females, and there is much less white on the dorsum. The yellow of the underparts is duller and sometimes washed with gray, and the remiges (which are much duller than those of the male) are more broadly edged with greenish or gray in most races. Females average smaller than males. Several of these sexual differences are foreshadowed even in juvenal plumage.

A detailed plumage description of both sexes will be found under the nominate race. The recognized subspecies, however, are given in approximate geographic order, from north to south. All measurements are in millimeters, to the nearest half millimeter. The wing was flattened against the ruler, and the bill measurement is that from the anterior edge of the nostril to the tip. Only adult birds were measured, but the list of ''specimens examined'' includes birds of all ages. No attempt was made to apply any statistical techniques beyond the arithmetic mean, since so many of the samples were small that such a treatment would be relatively meaningless.

Parus elegans edithae (McGregor)

Pardaliparus edithae McGregor, Philippine Journ. Sci., 2, 1907, p. 294. Type, from Calayan Island, Babuyan Group, in Bureau of Science, Manila, destroyed by fire in 1945.

Characters: Bill longer than that of any other race; wing long, and in sufficient series would probably average longer than other races. All yellows pale and dull; the cheek patches and nuchal spot creamy white rather than yellow. White spots on wing coverts reduced. Anterior dorsum black with little white spotting; posterior dorsum dark greenish gray.

Measurements: wing, 1♂, 70; 1♀, 68: bill, 1♂, 9.5; 1♀, 9.5.

Range: Babuyan Group, north of Luzon.

Specimens examined: Calayan, 2; Camiguin, 1.

Remarks: In view of the fact that only two adults were available for measuring, it seems desirable to quote figures given by McGregor (1909: 606) for two different specimens: wing (probably chord) of ♂, 67; of ♀, 63: bill from nostril of ♂, 10; of ♀, 9. With allowance made for the longer measurements of the flattened wing, McGregor's specimens thus agreed well with the two extant adult specimens.

Parus elegans montigenus (Hachisuka)

Pardaliparus elegans montigenus Hachisuka, Orn. Soc. Japan Supplementary Publ. 14, 1930, p. 200. Type (examined), from Haight's Place (2469 meters), 56 km. from Baguio, Mountain Province, Luzon. Formerly in Hachisuka Collection, now in collection of S. Dillon Ripley.

Characters: Nearest *elegans*, but all yellow areas averaging paler. Wing averaging slightly longer than *elegans*. Anterior portion of dorsum more solidly black, less spotted in male, but *more* spotted than *elegans* in female. Greenish posterior portion of dorsum darker, without any of the bluish-white wash often present in *elegans*. In females this area is grayer, less yellowish green. Nuchal spot in both sexes often elongated posteriorly to the middle of the back. White spots on wings averaging somewhat smaller.

Measurements: wing, 37♂, 64.5-72 (67.7); 21♀, 61.5-66 (64): bill, 35♂, 7.5-9 (8.3); 21♀, 7.5-9 (8.2).

Range: Highlands of northern Luzon.

Specimens examined: LUZON: *Mountain Province*: Baguio, 36; Haight's Place, 8; La Trinidad, 4; Irisan, 8; Mt. Data, 4; Santo

Thomas, 2; Sablan, 1. *Ilocos Norte Province*: Bangui, 1; Nagpratian, 1. *Abra Province*: Massisiat, 2.

Remarks: Delacour and Mayr (1946: 217) ascribe *P. e. elegans* to ''Luzon, lowlands,'' and *P. e. montigena* [*sic*] to ''highlands of Mindoro, Luzon.'' This is an error. The division on Luzon is on a north-south basis, with *elegans* being the race of southern Luzon both at high and low elevations. In view of the allocation by Delacour and Mayr, special attention was paid to a comparison of the Mindoro sample with *montigenus* and true *elegans*. The Mindoro population is not *montigenus*, but is inseparable from *elegans*.

Parus elegans gilliardi, new subspecies

TYPE, adult ♂, A.M.N.H. no. 459598, collected at Lamao, Bataan Province, Luzon, Philippine Islands, by E. Thomas Gilliard, December 6, 1947.

Characters: Similar to *P. e. elegans* of southern Luzon, but males more strongly washed with yellow dorsally; spots on foreback which are white in *elegans* are yellow in *gilliardi*; yellow of nuchal spot averaging deeper; white tips of wing coverts and tertials averaging larger and, in fresh plumage, with rather well-defined yellow edges; white spots at tips of rectrices averaging larger. Females brighter, more yellowish dorsally than *elegans*, with a larger yellow nuchal spot. The black areas of the female, particularly throat and wings, are more nearly as dark as in the males than is true of *elegans* and most other races of the species. Size averages somewhat larger than *elegans;* bill averages longer than any other race except *edithae*.

Measurements: wing, 6 ♂, 67-70 (68); 5 ♀, 63-67 (64.5): bill, 6 ♂, 8.5-9 (8.9); 5 ♀, 8-9 (8.6).

Range: Known at present only from the Bataan Peninsula of central-western Luzon. It may be presumed that *gilliardi* is the resident race in the entire Zambales-Mariveles chain. Three specimens from Antipolo, Rizal Province (east of Manila and north of Laguna de Bay) appear to be intermediate between *elegans* and *gilliardi*, suggesting the possibility that the latter race may have a wider distribution in central Luzon, south and perhaps also east of the range of *montigenus*, and north of that of *elegans*. Unfortunately the greatest part of the Zambales-Mariveles chain and virtually the entire mountain chain running the length of eastern Luzon are ornithologically unknown, and, in fact, are among the last frontiers for future ornithological discoveries.

Specimens examined: LUZON: *Bataan Province*: Lamao, 5; Mt. Cayapo, 3; Mariveles, 3.

Remarks: In Gilliard's (1950: 473) list of species polytypic on Luzon, he omitted *Parus elegans*, although the northern subspecies *montigenus* has been accorded general recognition. The only species which Gilliard considered to have an endemic race in the Zambales-Mariveles subregion of Luzon was *Nectarinia sperata*, in which he named *N. s. thereseae* from Lamao, Bataan. However, in his description of the latter race, Gilliard (1950: 500) admitted that *thereseae* represents a population both geographically and morphologically intermediate between the northern *N. s. henkei* and the southern *N. s. sperata*. Salomonsen (1953: 255) showed that Mariveles birds were inseparable from *sperata*, and believed that the Bataan population represents "an unstable hybridization zone between *henkei* and *sperata*," and he synonymized *thereseae* with the latter.

This left the Zambales-Mariveles subregion with no known endemic subspecies. As Gilliard has pointed out, this is somewhat surprising, as this mountainous area was wholly separated by water from the rest of Luzon until relatively recently, and the general pattern of Philippine zoogeography is such that endemism in this subregion might well be expected. This anticipation is now realized with the discovery that the population of the plastic *Parus elegans* inhabiting Bataan (and presumably the rest of this former island) represents a distinct subspecies. Unlike the case of *Nectarinia sperata*, the Bataan population of *Parus elegans* is *not* intermediate in its characters between the northern (*montigenus*) and southern (*elegans*) races, but represents extreme conditions in certain color characters, as well as averaging larger-billed than either of its neighbors; specifically, it is much yellower than either *montigenus* or *elegans*, although geographically intermediate between *elegans* and the *less* yellow *montigenus*. It seems highly appropriate to dedicate this attractive new subspecies to its collector.

The effect of wear and fading on the plumage of *Parus elegans* is relatively little for the first few months after the molt. By the end of the year, however, the change in appearance is sometimes quite radical. This is exemplified by two August specimens of *gilliardi* from Mariveles in the U. S. National Museum. In this pair, particularly the male, the yellows are so bleached and the back and flight feathers so worn as to make these specimens unidentifiable on the basis of color, although both exhibit the long bills (9 mm.) of *gilliardi*. A February specimen from Mariveles, however, shows the characters of *gilliardi* to good advantage. Fortunately for the study of *Parus elegans*, few collectors of Philippine birds have been in the field when these birds are in such poor plumage; of more than 200 specimens examined, only 11 July and 4 August adults were found.

Parus elegans elegans Lesson

Parus elegans Lesson, Traité d'Ornith., 1831, p. 456. No locality cited in original description. Type specimen in Muséum National d'Histoire Naturelle, Paris. See below under "Remarks."

Parus quadrivittatus Lafresnaye, Rev. Zool., 3, 1840, p. 129. Type locality "in Manilla aut in India." Type specimen (examined) in Museum of Comparative Zoölogy.

Pardaliparus elegans panayensis Mearns, Proc. U. S. Nat. Mus., 51, 1916, p. 57. Type (examined) from Panay, in U. S. National Museum.

Description: MALE. Top of head and sides of neck glossy black and slight blue reflections; an irregular nuchal spot of light yellow; mantle black with white spots at tips of scapulars and in center; lower back and rump greenish gray with slight yellowish tinge, washed with varying extent of bluish white; upper tail coverts and rectrices black, the latter with triangular white spots at tips; three outer pairs of rectrices with a portion of the outer web white; chin and throat deep velvety black; cheek patch and underparts yellow, grayer along flanks; wings black, with white tips to median and greater coverts forming two wingbars; secondaries and tertials tipped with white, the tips increasing in size proximally; primaries with very narrow whitish outer margin.

FEMALE. Top of head and sides of neck black, less glossy than male; nuchal spot paler yellow; most of back greenish gray, with some black and a few yellowish white spots in anterior portion; tail and wings as in male, but much duller, more brownish black, and white spots smaller; remiges with narrow but distinct outer margin of greenish or yellowish gray; chin and throat much duller black than male; cheek patch and underparts paler, duller yellow.

Measurements (Luzon specimens only): wing, 19 ♂, 63-69 (65.8); 6 ♀, 62-63.5 (62.7): bill, 18 ♂, 8-9 (8.5); 6 ♀, 8-9 (8.2).

Range: Luzon from the vicinity of Manila, south; Mindoro; Panay.

Specimens examined: No data (type of *Parus quadrivittatus* Lafresnaye), 1. LUZON: Manila, 2. *Rizal Province*: Antipolo, 3 (intermediate toward *gilliardi*); Jalajala, 3; Quisao, 1. *Laguna Province*: Mt. Makiling, 5; Longos, 1. *Tayabas Province*: Aloneros, 2; Tiaong, 2; unspecified, 4. *Albay Province*: unspecified, 1. *Sorsogon Province*: unspecified, 4. "Laguna de Bay," 3. MINDORO: Barawanan Peak, Halcon, 7; Ilong Peak, Halcon, 17; Alag River, 3; Mt. Dulangan, 1. PANAY: unspecified, 3.

Remarks: No locality of any sort was given by Lesson with his brief description of *Parus elegans*. Pucheran (1854: 68) redescribed Lesson's type specimen in detail, and stated that it had been presented to the national collection by Dusummier in 1820, and that it had come from the Philippines. According to Hachisuka (1931: 16), Dusummier stayed in Manila; that city is therefore here designated as the type locality of *Parus elegans* Lesson, a restriction necessary in view of the geographic variation in this species in the Philippines in general and in Luzon in particular. Pucheran's description of Lesson's type matches, as far as can be told, the southern Luzon race here called *elegans*.

Peters (1939: 105) pointed out that Lafresnaye's type of his *Parus quadrivittatus* had not been compared with specimens of the various races of *P. elegans*, although Mearns (1916: 59), in his revision, listed *quadrivittatus* as a synonym of *elegans*. I have examined Lafresnaye's type, and find it a good match for adult males of *P. e. elegans*. The type locality of *quadrivittatus* ("in Manilla aut in India") may thus also be safety restricted to Manila.

It was mentioned above that Mindoro birds are not *montigenus*, to which they have been referred by some authors. They match Luzon specimens of *elegans* both in color and in size. Measurements of Mindoro specimens, for comparison with figures from Luzon (above), are as follows: wing, 18 ♂, 64-69.5 (66.2); 8 ♀, 61-65 (62.6): bill, 16 ♂, 8-9 (8.4); 10 ♀, 8-9 (8.3).

The material from Panay is highly unsatisfactory, consisting only of the two males originally seen by Mearns, plus an additional female from the same (Worcester and Bourns) collection acquired by the National Museum at a later date. Mearns compared his "*panayensis*" only with *albescens*, although he had no topotypes of the latter subspecies at hand. Most of the characters described for "*panayensis*" can be matched in *elegans*. Although one of the principal characters used by Mearns was "less black on the upper back," most of the feathers of this critical area are missing in the type of *panayensis*! The other male specimen does, indeed, have less black than the average *elegans,* but the difference is relatively minor and may be considered to be a tendency in the direction of *albescens,* the next race to the south of Panay. Until better material is available, therefore, *panayensis* is best considered a synonym of *elegans.*

Parus elegans albescens (McGregor)

Pardaliparus albescens McGregor, Philippine Journ. Sci., 2, 1907, p. 293. Type, from Ticao Island, in Bureau of Science, Manila, destroyed by fire in 1945.

Pardaliparus elegans guimarasensis Mearns, Proc. U. S. Nat. Mus., 51, 1916, p. 58. Type (examined) from Guimaras, in U. S. National Museum.

Characters: Males immediately separable from all other races by the greater amount of white on the dorsum; white spots on anterior part of dorsum large, and a whitish wash extending over the posterior part; white spots on wing coverts much larger; black throat patch somewhat reduced in extent; underparts clearer yellow than *elegans,* with less darkening at flanks. Females with crown and throat patch duller black than *elegans,* the throat patch reduced in extent; anterior part of dorsum with more yellow and less black spotting, and posterior part yellower than *elegans;* spots on wing coverts slightly larger. Size about as in *elegans.*

Measurements: MASBATE: wing, 6 ♂, 64-67 (65.4); bill, 6 ♀, 8-9 (8.5); no females available. GUIMARAS: wing, 2 ♂, 63.5-65.5 (64.5); 1 ♀, 63: bill, 2 ♂, 8; 1 ♀, 8. NEGROS: wing, 14 ♂, 65-69 (67); 8 ♀, 64-66.5 (64.9): bill, 15 ♂, 8-9 (8.3); 8 ♀, 7.5-9 (8.1).

Range: Islands of Ticao, Masbate, Guimaras and Negros.

Specimens examined: MASBATE: Palanoc, 5 unspecified, 1. GUIMARAS, 3. NEGROS: Pula, Canlaon, 10; Canlaon Volcano, 2; Cuernos de Negros, Luzuriaga, 4; Inubungan, Santa Catalina, 4; San Antonio, 2; Naliong, Tolong, 1; Bacolod, 1; Bais, 1.

Remarks: When McGregor described *albescens,* he had before him two specimens from Ticao (not three, as claimed by Hachisuka, 1930: 201) and three from Masbate. As the type he chose one of the Ticao specimens. All of these skins were destroyed in 1945 with the burning of the building housing the Bureau of Science in Manila. I have written to every museum likely to have Philippine specimens in a vain search for additional Ticao material. Dr. Canuto G. Manuel of the Philippine National Museum and Dr. D. S. Rabor of Silliman University have both informed me that they know of no collecting activity on Ticao after McGregor's work there. It is therefore necessary, in the total absence of Ticao specimens of *Parus elegans,* to assign the populations of certain other islands to *albescens* on a more-or-less provisional basis. However, McGregor, the author of *albescens,* considered Ticao and Masbate specimens to be the same, and I have fortunately been able to assemble a series of six specimens from Masbate to use as presumably typical of *albescens* for comparative purposes.

Mearns named his race "*guimarasensis*" on the basis of a single female specimen in the U. S. National Museum. I have no females of *albescens* from Masbate (or, of course, Ticao) with which to compare the type of *guimarasensis*; however, I have been able to locate two males from Guimaras, one each in the American Museum of Natural

History and the British Museum (Natural History). These are indistinguishable from Masbate males, and on this basis *guimarasensis* is considered a synonym of *albescens.*

The arrangement of races and islands given by Delacour and Mayr (1946: 217-218) is apparently based chiefly on the revision by Hachisuka (1930). They assign the races of the central islands as follows: *guimarensis* [*sic*], Guimaras; *albescens,* Ticao; *visayanus,* Cebu, Masbate, Negros; *panayensis,* Panay. Hachisuka's revision of this species abounds in discrepancies and inaccuracies. He named *visayanus* with a type from Cebu, and assigned Masbate specimens to the new race. The material I have assembled clearly shows that Masbate birds have nothing to do with *visayanus,* and I follow McGregor in calling them *albescens,* as explained above. Hachisuka also assigned Negros and Panay to the range of his *visayanus,* although clearly stating that he had before him only undeterminable juveniles. He recognizes Mearns' race *panayensis,* although if, as Hachisuka claimed, Panay birds ''from all probabilities . . . belong to this new form [*visayanus*],'' then *visayanus* would obviously immediately fall as a synonym of *panayensis*! Hachisuka included both Cebu and Negros (as well as Ticao) in the range of *albescens,* then, on the following page, proceeded to erect *visayanus* with the type from Cebu! As previously mentioned, he had only juveniles from Negros, which he assigned as probably *visayanus.* This tentative identification has been widely adopted, by Delacour and Mayr and others. However, Negros birds, of which an ample series is available, are *not* the same as Cebu birds and are, in fact, closest to *albescens* where they were placed by Mearns. The assignment of subspecies in the central islands here adopted is much closer to that of Mearns (1916) than to that of any subsequent authors. His concept of *albescens* was largely correct, except that Guimaras birds (of which Mearns saw no males) are now added to *albescens,* and the subsequently-described race *visayanus* is recognized for birds from Cebu.

The Negros population differs slightly from *albescens* of other islands. The extent of white on the dorsum and wings of Negros males averages slightly less. The only female *albescens* available with which to compare Negros birds is the type of ''*guimarasensis*;'' this is slightly brighter dorsally and slightly more spotted with yellow above than are Negros females. There is also a small average difference in wing length, Negros birds being the larger. None of these differences is sufficient to warrant subspecific separation of the Negros population from *albescens,* and certainly not assignment to *visayanus.*

Parus elegans visayanus (Hachisuka)

Pardaliparus elegans visayanus Hachisuka, Orn. Soc. Japan Supplementary Publ. 14, 1930, p. 201. Type, from Danao, Cebu, in Bureau of Science, Manila, destroyed by fire in 1945.

Characters: Nearest *elegans* (not *albescens* as might be expected on geographic grounds), but males with rump bluish or grayish, without any yellow or greenish tinge; anterior dorsum slightly more heavily spotted with white; white spotting on wings slightly *less* extensive; yellow of cheeks and underparts less intense; flanks markedly grayer, less greenish. The one available female of *visayanus* is very similar to *elegans*, differing chiefly in having grayer flanks and slightly less white spotting on the wings. Males differ from *albescens* in having much less white on the dorsum, smaller white spots on the wings, a more extensive black throat patch, and much duller underparts.

Measurements: wing, 4 ♂, 64.5-66.5 (65.1); 1 ♀, 62.5: bill, 4 ♂, 8-9 (8.7); 1 ♀, 8.5.

Range: Known only from Cebu.

Specimens examined: CEBU: Toledo, 4; unspecified, 1.

Remarks: As mentioned above under *albescens*, the Elegant Titmice of various central islands, particularly Negros, have been assigned to *visayanus* by recent authors, but the latter name must be confined to the Cebu population. This accords well with the zoological subdivisions of the Philippines recognized by Worcester, who wrote (in McGregor and Worcester, 1906: 5) ''Cebu cannot be recognized as one of the central Philippine group, but must be classified by itself.''

The action of Manuel (1956: 320) in designating a ''neotype'' of *Pardaliparus elegans visayanus* Hachisuka from a locality (in Negros) other than the type locality was unjustified for several reasons. The Colloquium on Zoological Nomenclature in Copenhagen, in recommending that provisions be inserted in the International Rules of Zoological Nomenclature for recognizing neotypes as a category of type specimens, stated (Hemming, 1953: 28): ''(1) Neotypes are not to be designated for themselves alone, or as a curatorial routine, but only in exceptional circumstances when they are desirable in the interests of stability. (2) Neotypes are to be designated only in cases (preferably in revisionary work) in which they are relevant and essential to solving a confused zoological problem, such as the confused identities of closely related species for which holotypes are no longer extant.'' Such necessity is not demonstrated in Manuel's paper, in which no less than 28 ''neotypes'' are designated for subspecies originally named from the collections of the destroyed Bureau of Science. Further, the Colloquium recommended (p. 29) that neotypes be accepted, provided ''that, when the precise locality . . . from which the original holotype or lectotype was obtained is known, the neotype is shown to have come from as near as possible to that locality . . . subject only to the availability of material, and, in no case, to have come from a locality . . . outside the natural range of the species [or subspecies].'' Of the 28 ''neotypes'' designated in Manuel's paper, no less than 12 come from localities other than the original type locality within a major island (Luzon, Mindoro, Negros, Bohol, Mindanao), and three, including the ''neotype'' of *Pardaliparus elegans visayanus* Hachisuka, are actually from a different island than that of the type locality. This was unfortunate on several counts. In the first place, Cebu (topotypical) material *is* available of *Parus elegans*, though perhaps not in the Philippine National Museum. In the second place, the assumption that the subspecies found at Cuernos de Negros, Luzuriaga, Negros is identical with that of Cebu is here shown to be erroneous, and Dr. Manuel's ''neotype,'' therefore, *does* come from ''outside the natural range of'' the subspecies *visayanus*, and can have no standing in nomenclature.

Parus elegans mindanensis (Mearns)

Pardaliparus elegans mindanensis Mearns, Proc. Biol. Soc. Washington, 18, 1905, p. 8. Type (examined) from Mt. Apo (6200'), Mindanao, in U. S. National Museum.

Characters: Males with dorsum heavily washed with yellow, in this respect being nearest *gilliardi*, but decidedly smaller than that race, with more black spotting of the mantle and smaller spots on the wings; white wing spots broadly (rather than narrowly as in *gilliardi*) margined with yellow; differs from all races to the north in having the white areas on the outer margin of the outer rectrices washed with yellow; all primaries and secondaries with well-marked yellow margin to outer web, rather than a partial whitish or grayish margin to primaries only as in *elegans*. I believe the supposed posterior extension of the black throat patch mentioned by Mearns in his original description is an artifact of preparation. Females share with males the general yellowness of the plumage including the spots of wings and tail which are, if anything, yellower than those of the male. In addition there is a strong tendency in females to have the throat patch heavily washed with yellow, giving it an olive-green appearance. In fresh plumage the tips of the black crown feathers may also have greenish tips, giving a faintly scalloped appearance.

Measurements: wing, 10 ♂, 62-66 (63.3); 4 ♀, 60-62.5 (61.6): bill, 10 ♂, 7-8 (7.7); 5 ♀, 7.5-8.5 (7.9).

Range: Mindanao (highlands only? See below).

Specimens examined: MINDANAO: Mt. Apo (various localities), 12; Lake Lanao, 5; Tumadgopt, 2; Ayala, 2; Catagan, 1.

Remarks: Only three adult specimens from relatively low elevations on Mindanao are available; two poor skins, both male, from Ayala and one female from Catagan, 1100 feet. These specimens suggest that further material might well show that *mindanensis* must be restricted to Mt. Apo and vicinity, or at least to the highlands. The two Ayala males have the cheeks and underparts of a deeper, richer yellow than Mt. Apo males, and there is much *less* yellow on the margins of the white wing and tail spots. The single female differs even more strikingly from Mt. Apo females. The crown is blacker and glossier; the throat patch does not have the yellowish wash described above for female *mindanensis*; the underparts, cheeks, and nuchal spot are deeper yellow; there is more black on the anterior portion of the back; and, like the male, there is less yellow edging on white wing and tail spots. This lowland form cannot be placed with any of the more northern races, nor with the next race, *suluensis*, to the south.

Parus elegans suluensis (Mearns)

Pardaliparus elegans suluensis Mearns, Proc. U. S. Nat. Mus., 51, 1916, p. 59. Type (examined) from the Island of Sulu, in U. S. National Museum.

Characters: A very small and rather "hen-feathered" race. There is much less difference in color between the sexes than is the case in other subspecies of *Parus elegans*; males have a few whitish spots on the anterior part of the dorsum which are lacking in females; crown and throat patch of females are slightly duller black, and the underparts very slightly paler yellow. The race as a whole is pale with respect to its yellows, the nuchal spot in particular being almost white. The wing spots, which are relatively small, are tinged with yellow, although less so than in *mindanensis.* As in the latter race, males as well as females have both primaries and secondaries prominently edged with yellowish, a character confined to females in the northern races. The female may prove to have a more restricted nuchal spot than the male, although this portion of the plumage is defective in the two available female specimens.

Measurements: wing, 2 ♂, 61-62 (61.5) bill, 3 ♂, 7.5-8 (7.7); 1 ♀, 7.

Range: Presumably most of the Sulu Archipelago; specimens are known only from Sulu (Jolo) and Tawi-tawi.

Specimens examined: Sulu (Jolo), 4; Tataän, Tawi-tawi, 1.

Remarks: Mearns, when describing *suluensis,* had before him only three specimens, all from the island of Sulu. He stated in a footnote (Mearns, 1916: 60): "A form of *Pardaliparus elegans* was collected by Messrs Bourns and Worcester on the island of Tawi Tawi and Bongao. Possibly this may prove to be identical with the Sulu form, but I have not examined these specimens." A single adult male from Tawi-tawi does not differ in any respect from Sulu birds. Most unexpectedly, however, a small series from Bongao, a small island just off the southwestern tip of Tawi-tawi, proves to represent a highly distinctive population. The series, unfortunately, is a very poor one, consisting of two specimens labelled "♀" but almost certainly males, one very worn adult female, and one juvenile female. In view of the striking characters of the Bongao birds, however, and particularly their distinctiveness when compared with the neighboring *suluensis,* and in view of the fact that additional material from Bongao, although greatly to be desired, is not likely to be forthcoming in the near future, I venture to name this race on material which might under other circumstances be deemed inadequate.

Parus elegans bongaoensis, new subspecies

Type, adult "♀," probably ♂, R.O.M.Z. no. 13922, collected on Bongao Island, Sulu Archipelago, Philippine Islands, by Alfred Marche in December, 1884.

Characters: Smallest and darkest of the races of *Parus elegans.* The anterior part of the dorsum of the presumed males has much more black than in the neighboring *suluensis,* and the posterior portion is a blackish green, darker than in any other race. Edgings of remiges less yellowish, more greenish than in *suluensis* or *mindanensis;* white area on outer edge of outer rectrices much reduced in extent; white spots on wings about as in *suluensis,* but slightly smaller and with little or no yellow. The one adult female is a very worn specimen, but obviously a very dark bird with much reduction in white markings even prior to wear. The juvenile female is in good condition, and fortunately a juvenile female of *suluensis* is available for comparison. The specimens of *bongaoensis* is very much blacker on the entire dorsum, and has the white spots on the wing coverts very much reduced. The midventral region is a deeper yellow, contrasting rather sharply with olivaceous flanks.

Measurements: wing, 2 [♂], 56-62.5 (59.2); 1 ♀, 58.5: bill, 2 [♂], 7.5; 1 ♀, 7.

Range: Known only from Bongao Island, southwest of Tawi-tawi, Sulu Archipelago.

Specimens examined: Bongao, 4.

Remarks: The three specimens other than the type were collected, not by Bourns and Worcester, but by Everett. Mearns' statement that Bourns and Worcester had collected *Parus elegans* on Bongao is probably an error, since the latter authors (1894: 39) mention Tawi-tawi but not Bongao, and McGregor (1909: 605) lists only Everett as having collected the species on Bongao; he was probably unaware that Marche had secured it there.

LITERATURE CITED

Bourns, Frank S. and Dean C. Worcester. 1894. Preliminary notes on the birds and mammals collected by the Menage Scientific Expedition to the Philippine Islands. Occasional Papers Minnesota Academy of Natural Sciences, 1:1-64.

Delacour, Jean and Ernst Mayr. 1946. Birds of the Philippines. Macmillan, New York: xv+309 pp.

Gilliard, E. Thomas. 1950. Notes on a collection of birds from Bataan, Luzon, Philippine Islands. Bulletin American Museum of Natural History, 94:457-504.

Hachisuka, Masauji. 1930. Contributions to the birds of the Philippines. No. II. Part VI. Ornithological Society of Japan Supplementary Publication 14:139-222.

1931. The birds of the Philippine Islands. Volume I, Part I. Witherby, London: xx+168 pp.

Hemming, Francis (Editor). 1953. Copenhagen decisions on zoological nomenclature. International Trust for Zoological Nomenclature, London: xxix+135 pp.

Manuel, Canuto G. "1956" [=1957]. Neotypes of some Philippine birds. Philippine Journal of Science, 85:315-321.

McGregor, Richard C. 1909. A manual of Philippine birds. Bureau of Science, Manila: x+769 pp.

1920. Some features of the Philippine ornis. Philippine Journal of Science, 16:361-437.

McGregor, Richard C. and Dean C. Worcester. 1906. A hand-list of the birds of the Philippine Islands. Publications of Bureau of Government Laboratories, Manila, no. 36:1-123.

Mearns, Edgar A. 1916. On the geographical forms of the Philippine Elegant Titmouse, Pardaliparus elegans (Lesson), with descriptions of three new subspecies. Proceedings U. S. National Museum, 51: 57:65.

Peters, James L. 1939. Collections from the Philippine Islands. Birds. Bulletin Museum of Comparative Zoölogy, 86:74-128.

Pucheran, Jacques. 1854. Etudes sur les types peu connus du Musée de Paris (onzième article. *Passereaux conirostres.*) Revue et Magasin de Zoologie, 2nd Series, 6:62-74.

Salomonsen, Finn. 1953. Miscellaneous notes on Philippine birds. Vidensk. Medd. fra Dansk. naturh. Foren., 115:205-281.

Vol. 71, pp. 107-112 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE TYPE LOCALITY AND NOMENCLATORIAL STATUS OF PEROMYSCUS MANICULATUS NEBRASCENSIS (COUES)

By J. Knox Jones, Jr.

Two readily recognizable subspecies of *Peromyscus maniculatus* inhabit the northern Great Plains, *Peromyscus maniculatus osgoodi* in the west and *Peromyscus maniculatus nebrascensis* in the east. *P. m. orgoodi* is the larger, both externally and cranially, and is more grayish (less buffy) dorsally. The subspecific names currently used for these two kinds of mice are misapplied as shown below.

In his account of North American mammals, Baird listed in text (1858:462) the name *''Hesperomys sonoriensis,* var. *nebrascensis''* without description, definition or indication and the name as used by Baird is thus a *nomen nudum.* Nineteen years later, Coues (1877:79) listed the same name in synonymy under *Hesperomys leucopus sonoriensis* as *''Hesperomys sonoriensis* var. *nebrascensis,* Baird, M. N. A. 1857, 462 in text (based on the below-enumerated Nebraskan examples).'' Osgood (1905:77 and 1909:78-79) contended that *nebrascensis* of Coues also was a *nomen nudum,* and that a redescription of *nebrascensis* by Mearns (1890:287), based on a specimen from Calf Creek, Montana, was in fact the original description for the western subspecies from the northern Great Plains. Accordingly, Osgood described (1905:77) the eastern subspecies under the name *Peromyscus luteus* (type from Kennedy, Cherry Co., Nebraska). However, as Mearns (1911:102) pointed out, Coues gave brief critical remarks on coloration (*op. cit.*:28) and on length of tail (*op. cit.*:80), and listed measurements (*op. cit.*:80-82) for some specimens (which at that time he referred to *Hesperomys leucopus sonoriensis*), thereby satisfying the minimal requirements for a valid description. Mearns applied the name *nebrascensis* of Coues to the eastern subspecies (because he assumed it was based on specimens from Nebraska) and proposed a new name, *Peromyscus maniculatus osgoodi* (type from Calf Creek, Custer Co., Montana) for the western mice. As indicated above, the arrangement proposed by Mearns is currently in use.

Exactly what Coues intended to indicate as the ''below-enumerated Nebraskan examples'' is not clear. From 1854 until 1863 Nebraska Territory contained, in addition to what is now Nebraska, the southern half of Wyoming. Most of the specimens from the northern Great

Plains available to Coues were obtained in the period 1854-1863. A large proportion of these mice were from what is now southern Wyoming, but many of these were probably regarded by him as being from Nebraska, because they had been collected in Nebraska (*sensu lato*) and in many instances probably were noted as being from there on the specimen labels. In his list of specimens examined Coues usually did not indicate localities by state, perhaps because he was not sure in all instances where specimens actually originated. He did list several specimens from what is now Nebraska but did not identify them with the State. The only specimens that he did identify with Nebraska were two (USNM 4310-11) from ''Deer Creek, Nebr.'' and 18 (USNM 10401-18) from '' 'Nebraska'.'' Subsequent workers (Osgood, 1909; Mearns, 1911) quite naturally assumed that Coues' ''below-enumerated Nebraskan examples'' were the two Deer Creek specimens because 1) they were the first Nebraskan specimens listed by him, and 2) they were the only specimens he identified with a precise locality in Nebraska. Osgood (*op. cit.*:78-79) went so far as to say, ''. . . Coues . . . states that Baird based the name upon two specimens from Deer Creek, Nebraska.'' Coues stated nothing of the sort and, in fact, the specimens from Deer Creek were not even in existence at the time of publication (1858) of Baird's monograph, having been collected in January, 1860. Nonetheless, because Coues' description of *nebrascensis* validates that name, even though he obviously did not intend his description to do so, subsequent revisors were at liberty to designate as the type locality any locality in Nebraska (*sensu lato*) from which Coues listed specimens.

This was done, as I see it, by Osgood (*loc. cit.*) and Mearns (*op. cit.*:102), acting as revisors, with their mention of Deer Creek, and the latter has been accepted as the type locality for *P. m. nebrascensis* by all subsequent authors known to me (see, for example, Miller, 1912:147; Miller, 1924:329; Cockrum, 1952:172; Miller and Kellogg, 1955:482). The type locality usually has been listed by later workers as ''Deer Creek, western Nebraska.''

Having established ''Deer Creek, Nebr.'' as the type locality of *P. m. nebrascensis*, there remains the problem of the precise location of Deer Creek. Miller and Kellogg (*loc. cit.*), without comment, identified it as the Deer Creek in Sheridan County, Nebraska. The syntypes of *nebrascensis* (USNM 4310-11) were contained in a lot of 40 mammal specimens obtained from Deer Creek by the Yellowstone exploration party of Capt. W. F. Raynolds, Topographic Engineers, including collectors F. V. Hayden and G. H. Trook, between November 23, 1859, and February 21, 1860 (see original catalogue, United States National Museum, nos. 4236-61, 4271, 4296-97, 4303-08, 4310-12, 4315). Raynolds' party went into winter quarters on or about October 18, 1859, along Deer Creek, approximately five miles from its mouth, in what is now Converse County, Wyoming (see Senate Executive Documents, 2nd Session of the 40th Congress, 2(No. 77):1-174, with fold-out map, 1868, for a documented history of the party). They broke winter quarters on May 10, 1860. The two specimens of *Peromyscus* in question were obtained on January 17, 1860 (USNM 4311, original no. 79), and January 19, 1860 (USNM 4310, original no. 80). It should be mentioned that Baird erroneously listed the dates of collection of these two specimens as June 17 and June 19, 1860, when he recopied from the original catalogue into the catalogue currently in everyday use at the U. S. National Museum. I do not know whether this error on Baird's part contributed to the subsequent confusion concerning the exact location of Deer Creek.

Several of Osgood's co-workers in the Biological Survey were aware of the correct location of Deer Creek. Nelson (1909:78 and 207) recorded from Wyoming lagomorphs contained in the original Deer Creek collection. Goldman (1910:105) recorded a *Neotoma cinerea orolestes* from the original collection from ''Deer Creek, Converse County'', Wyoming. Hollister (1916:19) correctly listed one of the two original *Cynomys ludovicianus ludovicianus* from Deer Creek, Wyoming. Osgood, nevertheless, seemed to think that the Deer Creek concerned was actually in Nebraska. He assigned (1909:77) all *maniculatus* available to him from eastern Wyoming to his *P. m. nebrascensis* [currently equals *P. m. osgoodi*], but he listed (*op. cit.*: 79) as from Nebraska a single specimen from Deer Creek under his *P. m. luteus* [currently equals *P. m. nebrascensis*]. This oversight on Osgood's part may have contributed to the incorrect assumption by subsequent authors that the Deer Creek mentioned by Coues was in what is now Nebraska. Actually the type locality of *P. m. nebrascensis* is in Converse County, Wyoming, within the geographic range now associated with *P. m. osgoodi,* not in Sheridan County, Nebraska.

As noted above, Osgood listed one of the syntypes of *nebrascensis* in 1909. I have searched the collections of the U. S. National Museum for the specimens from Deer Creek but neither is now to be found. Poole and Schantz (1942) did not list either of the specimens and I presume they are no longer in existence.

I have examined a series of *Peromyscus maniculatus* from the vicinity of Casper, Natrona County, Wyoming (KU 15593-96, 27506-14), approximately 23 miles west of Deer Creek and another series from the vicinity of Bill, Converse County, Wyoming (KU 32658-69), northeast of Deer Creek. The mice in these series agree with other specimens seen by me from the plains of eastern Wyoming and eastern Montana, and from extreme northwestern Nebraska, in large cranial and external size and buffy-gray coloration dorsally. Therefore, *Peromyscus maniculatus nebrascensis* (Coues, 1877) is the valid name for the mice of the western part of the northern Great Plains that are currently known as *P. m. osgoodi,* whereas *Peromyscus maniculatus luteus* Osgood, 1905, is the correct name for the smaller, more buffy-colored mice to the east that are currently known as *P. m. nebrascensis.*

Synonymies (original description followed by other pertinent citations in chronological order) and geographic ranges (modified from Miller and Kellogg, 1955:482) of *nebrascensis* and *luteus* are as follows:

Peromyscus maniculatus nebrascensis (Coues)

Hesperomys sonoriensis var. *nebrascensis* Coues, *in* Coues and Allen, Monographs of North American Rodentia, U. S. Geol. Surv. Terr., 11: 79, August, 1877, syntypes from Deer Creek, approximately five miles from its mouth, Converse Co., Wyoming.

Hesperomys leucopus nebrascensis, Mearns, Bull. Amer. Mus. Nat. Hist., 2:285, February, 1890 (a redescription of *nebrascensis* on p. 287, based on a specimen from Calf Creek, Custer Co., Montana).

Peromyscus texanus nebrascensis, J. A. Allen, Bull. Amer. Mus. Nat. Hist., 8:251, November, 1896 (part); Miller and Rehn, Proc. Boston Soc. Nat. Hist., 30:85, December, 1901.

Peromyscus maniculatus nebrascensis, Osgood, N. Amer. Fauna, 28: 75, April 17, 1909.

Peromyscus maniculatus osgoodi Mearns, Proc. Biol. Soc. Washington, 24:102, May 15, 1911, type from Calf Creek, Custer Co., Montana; Miller, Bull. U. S. Nat. Mus., 79:147, December 31, 1912; Miller, Bull. U. S. Nat. Mus., 128:328, April 29, 1924; Miller and Kellogg, Bull. U. S. Nat. Mus., 205:482, March 3, 1955.

Geographic distribution.—Southern Saskatchewan and southern Alberta, south through most of Montana and most of Wyoming; parts of western North and South Dakota, northwestern Nebraska and eastern Colorado, south through the Oklahoma Panhandle to northwestern Texas; northeastern Utah and adjacent parts of Colorado and Wyoming.

Peromyscus maniculatus luteus Osgood

Peromyscus luteus Osgood, Proc. Biol. Soc. Washington, 18:77, February 21, 1905, type from Kennedy, Cherry Co., Nebraska.

Peromyscus texanus nebrascensis, J. A. Allen, Bull. Amer. Mus. Nat. Hist., 8:251, November, 1896 (part).

Peromyscus maniculatus luteus, Osgood, N. Amer. Fauna, 28:77, April 17, 1909.

Peromyscus maniculatus nebrascensis, Mearns, Proc. Biol. Soc. Washington, 24:102, May 15, 1911; Miller, Bull. U. S. Nat. Mus., 79:147, December 31, 1912; Miller, Bull. U. S. Nat. Mus., 128:328, April 19, 1924; Miller and Kellogg, Bull. U. S. Nat. Mus., 205:482, March 3, 1955.

Geographic distribution.—Southwestern North Dakota and most of western South Dakota, south through central and southwestern Nebraska, western Kansas and extreme eastern Colorado, western Oklahoma and the eastern parts of the Texas Panhandle.

LITERATURE CITED

Baird, Spencer F. 1858. Mammals, *in* Explorations and surveys for a railroad route from the Mississippi River to the Pacific Ocean, 8(1): xlviii + 757, pls. 17-60, July 14.

Cockrum, E. Lendell. 1952. Mammals of Kansas. Univ. Kansas Publ., Mus. Nat. Hist., 7:1-303, 73 figs., August 25.

Coues, Elliott. 1877. Muridae, pp. x + 264, 5 pls., *in* Coues and Allen, Monographs of North American Rodentia, U. S. Geol. Surv. Territories, 11:xii + x + 1091, 6 pls., August.

Goldman, Edward A. 1910. Revision of the woodrats of the genus Neotoma. N. Amer. Fauna, 31:1-124, 8 pls., 14 figs., October 19.

Hollister, N. 1916. A systematic account of the prairie-dogs. N. Amer. Fauna, 40:1-37, 7 pls., 2 figs., June 20.

Mearns, Edgar A. 1890. Description of supposed new species and subspecies of mammals, from Arizona. Bull. Amer. Mus. Nat. Hist., 2:277-307, February.

———— 1911. New names for two subspecies of *Peromyscus maniculatus* (Wagner). Proc. Biol. Soc. Washington, 24:101-102, May 15.

Miller, Gerrit S., Jr. 1912. List of North American land mammals in the United States National Museum, 1911. Bull. U. S. Nat. Mus., 79:xiv + 455, December 31.

——— 1924. List of North American Recent mammals 1923. Bull. U. S. Nat. Mus., 128:xvi + 673, April 29.

Miller, Gerrit S., Jr., and Remington Kellogg. 1955. List of North American Recent mammals. Bull. U. S. Nat. Mus., 205:xii + 954, March 3.

Nelson, E. W. 1909. The rabbits of North America. N. Amer. Fauna, 29:1-314, 13 pls., 19 figs., August 31.

Osgood, Wilfred H. 1905. A new name for the *Peromyscus nebracensis* of certain authors. Proc. Biol. Soc. Washington, 18:77, February 21.

——— 1909. Revision of the mice of the American genus Peromyscus. N. Amer. Fauna, 28:1-285, 8 pls., 12 figs., April 17.

Poole, Arthur J., and Viola S. Schantz. 1942. Catalog of the type specimens of mammals in the United States National Museum, including the Biological Surveys collection. Bull. U. S. Nat. Mus., 178:xiii + 705, April 9.

Transmitted February 24, 1958, Museum of Natural History, University of Kansas, Lawrence.

Vol. 71, pp. 113-118 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON THE IDENTITY OF *PSEUDOTREMIA CAVERNARUM* COPE, A POORLY KNOWN AMERICAN CHORDEUMOID DIPLOPOD

By Richard L. Hoffman

Uncritical reliance upon the authority of early workers has led many systematists into difficulty and this situation can hardly be better exemplified than by the history of the name *Pseudotremia cavernarum*. In this case the trouble started with the treatment of the species in the otherwise faultless "Craspedosomatidae of North America" (Cook and Collins, 1895), and has been perpetuated by workers who have recently dealt with the genus. In current usage the name is associated with a species entirely different from that upon which I believe Cope originally based it.

Ever since the spring of 1947, when I first encountered a member of the genus, I have been accumulating material for an eventual monographic treatment of *Pseudotremia*. Typical material of most of the known forms, as well as nearly a score of undescribed species, has been acquired, but the higher priority of several other projects makes it likely that several years may elapse before the revision will appear in print. For this reason it seems desirable to clarify the status of *cavernarum*—the type species of *Pseudotremia*—for the benefit of other investigators who may have to deal with the genus in one way or another.

The name *Pseudotermia* was proposed by E. D. Cope in 1869 to embrace two new millipeds which he collected in southwest Virginia as well as the species which H. C. Wood had described under the name *Spirostrephon caesioannulatus*. The genus thus originally contained three species, and the statement in the "Checklist of the millipeds of North America" (Chamberlin and Hoffman, 1958) that *cavernarum* is the generotype by monotypy is in error. Of Cope's new species, *vudii* was described from a single female without precise locality data but thought to be from Montgomery County, Virginia, while *cavernarum* was

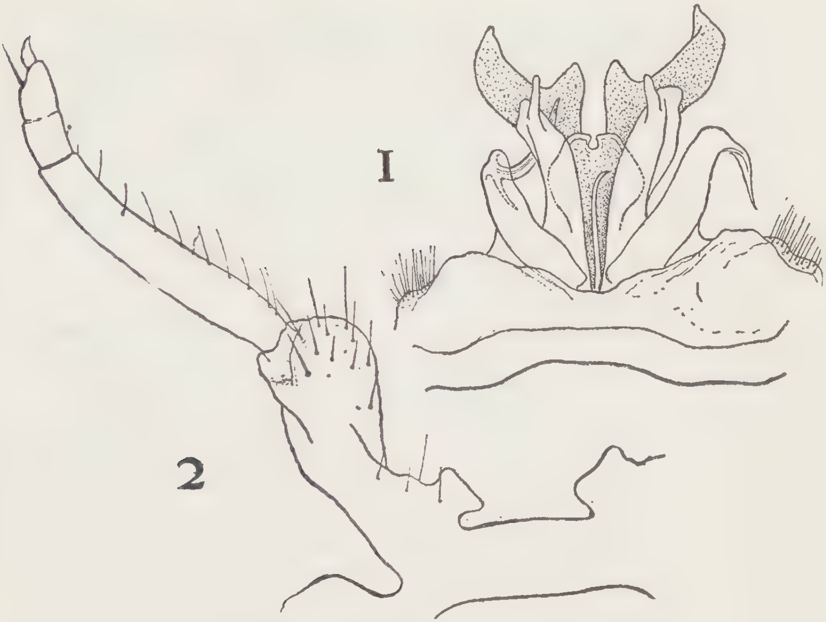
". . . taken in Erhart's Cave, Montgomery County, and Spruce Run and Big Stony Caves, in Giles County," Virginia. In two subsequent papers (1870, 1872) Cope reported material under the name *P. cavernarum* from caves in east Tennessee and southern Indiana, additional Indiana records later being published by McNeill (1888) and Bollman (1888).

When Cook and Collins studied the American chordeumoids for their 1895 paper, their concept of *cavernarum* was drawn from material collected in Wyandotte and Marengo Caves, Crawford Co., Indiana. Oddly enough, they apparently did not challenge the validity of the earlier identifications of the Indiana population, which were made in the era before male genitalia were utilized as specific characters. In other respects the quality of the "Craspedosomatidae" was so high that it has set a standard of excellence yet to be equalled in American diplopod literature, and so far only one, somewhat misguided, dispute of its accuracy has arisen.

From the time of my first acquaintance with the genus, it has not seemed likely to me that a typically cavernicolous diplopod described from southwest Virginia would occur over such a wide geographic range as had been ascribed to it. Solution of the problem seemed to depend on relocating Cope's original localities, and upon taking up residence in Montgomery County, Virginia, in 1950, I set out to accomplish this. Numerous caves in both Montgomery and Giles counties were explored for millipeds, and it gradually became evident that the two caves named by Cope in the latter county were inhabited solely by a large, strongly pigmented species which has recently been described by Loomis (1944) under the name *Pseudotremia sublevis.* Although Cope had stipulated that his species was rather small and pallid, I assumed that (1) he may have had only immature specimens, and (2) that only one species occurred in the New River drainage basin including the two counties mentioned. On these somewhat tentative guesses, *sublevis* was reduced to synonymy under *cavernarum* in the "Checklist."

During the foregoing explorations, the location of Erhart's Cave was never ascertained, and it was not until 1957 that Dr. Thomas C. Barr, Jr., supplied me with the necessary details. A prompt investigation brought surprising results: a small bodied, colorless species which matches Cope's description exactly and which is almost certainly the original of *Pseudotremia cavernarum.* The cave which it inhabits is in the eastern half of Montgomery County, drained by the Roanoke River east into the Atlantic, and the species is trenchantly different from that of the New River drainage (*sublevis*) as well as from the population of southern Indiana.

It is now obvious that the records cited by Cook and Collins for *cavernarum* actually apply to four or more different species. As first reviser of the complex, I herewith restrict the type locality, from the three caves originally mentioned, to Erhart's Cave, in the village of Ellett, Montgomery County, Virginia. The name *sublevis* of Loomis is accordingly resurrected from its unwarranted sojourn into synonymy. The Indiana population described and figured by Cook and Collins has already received a new name, *Pseudotremia indianae,* in the "Checklist."



Pseudotremia cavernarum Cope
Figures 1, 2

Pseudotremia cavernarum Cope, 1869, Proc. Amer. Philos. Soc., vol. 11, p. 179.

The species is to be diagnosed primarily upon the shape of the gonopods and ninth legs, as illustrated, with the additional notes which follow as supplementary specific characters:

Size moderate for the genus, adults ranging from about 20 to 27 mm in length (specimens over 25 mm very scarce), and up to 1.8 mm in greatest diameter. The body shape is very slightly fusiform, the 6th and 7th segments being widest in males, but only a little broader than the adjoining segments.

Color varying from almost completely white to a pale yellowish tan, the pigment when present concentrated on the dorsal surface of the anteriormost segments, head and mandibles usually darkest; basal articles of antennae pigmented but the distal two always pure white. Lower sides and legs whitish-gray.

Texture of tergites nearly obliterated, the dorsolateral knobs so common to many forms of the genus are here only poorly defined longitudinal swellings, subtended on the sides by vague striation; surface of dorsum chiefly smooth. Dorsal setae very slender and acicular, instead of clavate.

Ocelli present in elongated triangular patches, usually about 15 in each, with only half or less of the ocelli pigmented.

Gonopods typical for the genus, in anterior aspect seen to have a wide sternite and transversely elongate, mesially fused syncoxites, the latter densely setose laterally. Distal elements consist of two major divisions:

(1) two anterior bifid joints, the lateral branches of which are grooved, curving caudad and then mesiad, each with a small spur at about the midlength; the mesial branch projecting distad, with a smaller subapical process.

(2) a pair of large, basally fused flat plates (the ''bifid laminae'' of Cook and Collins) which carry a large zygomatic subcordate structure, itself subtended on the anterior side by a slender median aciculate process extending distad between the anterior elements of the gonopod.

Ninth legs as illustrated, the second joint rather long and slender, the two distalmost joints very indistinctly segmented and in some specimens not clearly set off from the second.

Although the gonopods appear at first glance to represent a unique development in the Cleidogonidae, they are in actuality not greatly removed from the form typical of *Cleidogona.* The ''bifid laminae'' emphasized by Cook and Collins as diagnostic of *Pseudotremia* are actually homologous with the somewhat smaller and separate posterior processes of the gonopod of *Cleidogona,* which are likewise held by the coxal lobes of the 9th legs when at rest, just as in Pseudotremia. The latter genus, to be sure, has become much more specialized in gonopod structure, but the morphological similarities are clear. A precise terminology is still in a developmental stage, pending completion of detailed anatomical studies, so that no specific descriptive names are introduced at this time.

It is a matter of interest that no one has heretofore observed or remarked the presence of the zygomatic structure formed by the posterior laminae of the gonopods, for it is present in most of the species which I have studied, its shape varying with the different forms. The median spine is likewise present in most species, although often quite short and not readily visible. In some, such as *P. indianae,* the process is very long and distally bifid.

The outer member of the anterior division of the gonopods is distinctly grooved or channeled, and presumably functions as a form of solenomerite, although this development must be quite rare in the suborder Chordeumidea. I have so far been unable to detect a basal gland or duct through gross dissections, but at this writing am preparing sectioned material for a more precise microscopic study of the situation. A similar grooving of the gonopod appears not to be present in the genus *Cleidogona,* but does occur in the Guatemalan *Solaenogona.*

Pseudotremia cavernarum has not yet been found elsewhere than the type locality. The material at hand consists of males and females cataloged under numbers 6991, April 25, 1957, and 7285, April 8, 1958.

The following two citations are of the closest interest to the history of *P. cavernarum;* the others cited in the text can be located, by the date cited, in the bibliography accompanying the recently published ''Checklist of the millipeds of North America'' (U. S. Nat. Mus. Bull. No. 212, 1958).

REFERENCES

Cook, Orator F., and G. N. Collins. 1895. The Craspedosomatidae of North America. Ann. New York Acad. Sci., vol. 5, pp. 1, figs. 1-100.

Cope, Edward D. 1869. Synopsis of the extinct Mammalia of the cave formations of the United States, with observation on some Myriapoda found in and near same. Proc. Amer. Philos. Soc., vol. 11, pp. 171-192.

Figures 1, 2. *Pseudotremia cavernarum* Cope, from male topotype. 1, anterior aspect of gonopods, the accessory posterior elements lightly stippled. 2, ninth leg and part of sternum, caudal aspect (figures drawn to same scale).

Vol. 71, pp. 119-124 July 16, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW VENEZUELAN BIRDS AND DISTRIBUTIONAL NOTES

By William H. Phelps and William H. Phelps, Jr.

Besides the new forms described here from our collection, we have added some taxonomic and distributional data which we consider of interest. We wish to thank the Curators of the American Museum of Natural History, British Museum, Carnegie Museum, Muséum National d'Histoire Naturelle, Pons Collection (Maracaibo), Rancho Grande Biological Station and U. S. National Museum for access to the collections of these institutions and for their aid in our research.

Specimens listed are in the Phelps Collection, Caracas, unless otherwise specified. Names of colors are capitalized when direct comparison has been made with Ridgway's "Color Standards and Color Nomenclature," 1912. Wing measurements are of the chord.

Leucopternis schistacea (Sundevall)

Asturina schistacea Sundevall, Ofv. K. Vet—Akad. Förh., 7, p. 132, nota, 1850. (Rio Negro, Brazil.)

1 ♂, San Fernando de Atabapo; 1 ♂ imm., Cerro Yapacana, Terr. Amazonas; in forest at 110 meters. These are the only specimens known from Venezuela. The immature male is similar to the all slate adult except that the abdomen, under tail-coverts, under wing-coverts and inner webs of the remiges are barred with white.

Ortalis ruficauda ruficrissa (Sclater and Salvin)

In our "Lista de las Aves de Venezuela con su Distribución" (Vol. 2, Part 1, Non Passeres, May, 1958) we have considered *O. ruficrissa* to be conspecific with *O. ruficauda* (Jardine) because of twelve specimens in our collection from the eastern shore of Lake Maracaibo. These are 1 ♂ from Mene Grande, 1 ♂ from Río Aurare (Palmarejo) and ten complete tails from mutilated specimens also from Mene Grande.

The only noticeable difference between the former species *ruficrissa* and *ruficauda* is that the former has white tips to the tail feathers and the latter rufous ones. The twelve specimens mentioned above have the tips to the tails intermediate in color, more or less buffy instead of either white or rufous. The two forms have not been found together. Typical *ruficauda* is found at Quebrada Arriba, Lara, at the foot of Cerro El Cerrón, at a distance of forty miles to the northeast of Mene Grande and typical *O. ruficauda baliolus* Osgood and Conover (formerly *O. ruficrissa baliolus*) occurs at a similar distance to the south.

A specimen in the American Museum of Natural History from twenty miles north of Cúcuta, Colombia, collected by Hermano Nicéforo María, also has the tip of the tail intermediate in color. Another specimen in the collection of Hermano Nicéforo Maria from Petrólea, fifty miles north of Cúcuta, has the tail typically *baliolus*, thus indicating the instability of this character in the area where the two forms meet.

Rynchops nigra nigra Linné

We can find only one valid record of this migrant for Venezuela. Mr. J. D. Macdonald, Deputy Keeper-Zoology, of the British Museum, writes to us that the only specimen of *R. n. nigra* in the Museum is the one collected by Lowe at the Laguna Grande del Obispo, Golfo de Cariaco, on January 14, 1904. At the same time Lowe collected a specimen of *R. n. cinerascens* Spix, the common Venezuelan resident. The Museum has two other specimens of *cinerascens* collected at other times from the same locality.

When Lowe visited the same locality again on the yacht Zenaïda on January 3, 1908, he reported[1] ''*Rynchops nigra* present in enormous quantities.'' Apparently he did not collect any specimens as they are not in the British Museum. As the two forms are so similar, we do not doubt that the ''enormous quantities'' were the common form in Venezuela, *cinerascens*, and not the apparently rare migrant known in Venezuela from one specimen.

Aëronautes noctivagus (d'Orbigny and Lafresnaye)

Cypselus montivagus d'Orbigny and Lafresnaye, Rev. Zool., p. 70, 1837. (Santa Cruz de la Sierra, Bolivia.)

1 ♂, Rancho Grande (1100 m.), Aragua; 1 ♀, Pico de Naiguatá (2600 m.), Miranda; 1 [♀], Curupao (1200 m.), Guarenas; 4 ♂, 1 [♂], 2 ♀, Cerro Duida (1900 m.), Terr. Amazonas; 3 ♀, Cerro Yapacana (1300 m.).

In 1929, Chapman[2] described *Duidia tatei* on one specimen from Mount Duida. Later,[3], in 1931 he changed the name to *Aëronautes montivagus tatei* (Chapman). Since then, we have collected seven more specimens from Duida and three from nearby Cerro Yapacana and have examined in the U. S. National Museum 1 ♀ and 1 imm. from Serra Imeri on the Brazilian frontier, and in the American Museum of Natural History 2 ♂ from Cerro Auyan-tepui. So there are in all 15 specimens of former *tatei* from southern Venezuela.

Now, with those fifteen specimens available, we find that *tatei* cannot be separated from the twenty-four specimens of *montivagus* in the Carnegie Museum nor from the four in our collection from the north coast mountains of Venezuela. Consequently there is only one form in Venezuela, which we have not been able to separate from the very few specimens from Perú and Bolivia which we have examined: in the American Museum of Natural History, 1 ♂, 1 ♀, from Vermejo, Bolivia; 1 ♀, Urubamba Cañon, Perú; and in the Academy of Natural Sciences in Philadelphia, 1 ♀, Junín, Perú.

---

[1] Notes on some Birds collected during a cruise in the Caribbean Sea. Ibis, p. 322, 1909.

[2] Descriptions of New Birds from Mt. Duida. American Museum Novitates. No. 380. p. 11, Oct. 21.

[3] The Upper Zonal Birds of Mounts Roraima and Duida. Bulletin American Museum of Natural History, *63*, pp. 68-70.

Other specimens which we know of but have not examined: Pons Collection, Maracaibo, 1 ♀, El Escondido, Perijá; Rancho Grande Biological station, 2♂, 1 ♀; Paris Museum, the mounted type; probably in the Berlepsch Collection in Frankfort, 1 specimen from Huaynapata, Perú, and in the Warsaw Museum, collected by Jelski and Stolzmann, five from Perú from Lima, Huambo, Huanta, Monterico and Pumamarca.

Leucippus fallax (Bourcier)

The senior author examined two specimens from "Cayenne" in the Paris Museum and found them similar to *L. f. richmondi* Cory from the coast of northeastern Venezuela. They form part of a collection made in French Guiana by M. F. Geay during 1900 and 1902. Ménégaux[4] 1904: 114 cites these specimens "sans lieu précis d'origine," as do Berlepsch[5] 1908: 265 and Simon[6] 1921: 318. Berlepsch *idem* "—also a true Cayenne skin from the Gould collection in the British Museum," and Simon *idem* cites a specimen in the British Museum but the senior author did not find it there in 1951.

Peters 1945: 59 limits the range of the species to Venezuela and Colombia. It is characteristic of the Caribbean Fauna of Chapman[7] which comprises the arid Caribbean littoral from northeastern Colombia to Carúpano at the base of the Peninsula of Paria. Inasmuch as these specimens lack precise localities and dates, and as the species is not known from southeastern Venezuela, nor from British or Dutch Guiana, we believe that they may be commercial skins from another locality, probably from the northeastern coast of Venezuela.

Hypnelus ruficollis striaticollis, new subspecies

Type: From Dabajuro, Estado Falcón, Venezuela. No. 7429, Phelps Collection, Caracas. Adult male collected March 22, 1940, at sea level, by Fulvio Benedetti. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from all other subspecies of *H. ruficollis* (Wagler) by having more or less prominent black lines across the lower throat, and occasionally black bases to these feathers, instead of having the lower throat immaculate as in *ruficollis, decolor* Todd and *coloratus* Ridgway, or with a solid black band as in *bicinctus* (Gould) and *stoicus* Wetmore.

---

[4] Catalogue des Oiseaux rapportés par M. Geay de la Guyane française et du Contesté franco-brésilien. Bulletin du Muséum d'Histoire Naturelle, No. 3, pp. 107-118, et No. 4, 174-185.

[5] On the Birds of Cayenne. Novitates Zoologicae, *15*, No. 1, pp. 103-164. N.o 2, pp. 263-324.

[6] Histoire Naturelle des Trochilidae. pp. 1-416. Paris.

[7] The Distribution of Bird Life in Colombia. Bull. Am. Mus. Nat. Hist., *36*, pp. 1-729.

Range: Known from the Caribbean coast region from Quisiro, Zulia to Dabajuro, Falcón; at sea level.

Description of Type: Upper parts nearest to Bister; top of head faintly lined with buffy; back and wings mottled with buffy white; upper tail-coverts black, barred with buffy; a semi-concealed white collar across nape; forehead against bill buffy white; lores and ear-coverts white, latter with black tips; wide maxillary stripe brownish black. Under parts Light Ochraceous-Buff; lower throat heavily lined with black on a buffy white ground, some of the feathers with black bases, thus forming an indistinct band; lower breast with a broad brownish black band; flanks mottled with brownish black; axillaries brownish black. Outer margins of more central primaries with median buffy white patches; other remiges lightly margined basally with buffy white, more extensively so towards tertials; bend of wing Light Ochraceous-Buff; under wing-coverts buffy white. Tail darker than Natal Brown, paler on under surface, the feathers lightly margined with buffy white.

Bill (in life) "black"; feet "gray"; iris "yellow." Wing, 86 mm.; tail, 78; exposed culmen, 28; tarsus, 19.

Remarks: Sexes alike. Size similar to *decolor*. Range of measurements: five adult males, including type—wing 83-86 (84.4) mm.; tail, 75-80 (77.8); exposed culmen, 27-31 (29.2); five adult females—wing, 85-87 (86.7); tail, 79-82 (80); exposed culmen, 30-33 (30.8). Measurements of *H. r. decolor*: five adult males—wing, 82-90 (85.8) tail, 73-82 (77.6); exposed culmen, 27.5-30 (28.9); five adult females—wing, 86-91 (87.8); tail, 81-86 (83.6); exposed culmen, 30-33 (31.6).

This local race, with the incipient black band across the lower throat, is intermediate between the one banded form *H. ruficollis* and the two banded form *H. bicinctus.* The only difference between the two is the lack of the second band in *ruficollis.* Their ranges do not overlap.

We have in our collection a male specimen of *bicinctus* from Ciudad Bolívar, very far removed from the range of *ruficollis,* which is similar to the type of the new *striaticollis,* with the same incipient throat band, lined instead of solid black. These specimens indicate that the hitherto so called species are conspecific, *bicinctus* being a subspecies of *ruficollis.*

Specimens Examined

H. r. ruficollis.—VENEZUELA: Perijá region (var. locs.), Zulia, 8 ♂, 3 ♀; La Fría, Táchira, 1 ♂; Mene Grande, Zulia, 1 ♂, 7 ♀, 2 (?). COLOMBIA: Lorica, 1[8]; Gamarra, 1[8]; Santa Marta, 20[8]; Santa Marta, 22[9].

H. r. decolor.—VENEZUELA: Paraguaipoa, Zulia, 6 ♂, 2 ♀; Cojoro, 1 ♂; Río Socuy (El Aral), 1 ♀; Santa Cruz de Mara, 1 ♂; Maracaibo, 1 (?); Río Aurare, 3 ♂, 1 ♀, 1 (?); Cabimas, 1 ♂, 1 ♀; Peninsula Paraguaná (var. locs.), Falcón, 11 ♂, 15 ♀, 1 (?); Quiuragua, 1 ♂. COLOMBIA: Río Hacha, 6[9].

H. r. coloratus.—VENEZUELA: Santa Bárbara, Zulia, 4 ♂, 5 ♀; El Vigía, Mérida, 3 ♂; Dividivi, Trujillo, 1 ♂, 2 ♀.

H. r. striaticollis.—VENEZUELA: Quisiro, Zulia, 1 ♂; Casigua, Falcón, 3 ♂; Dabajuro, 3 ♂ (inc. type), 6 ♀.

---

[8] Specimens in American Museum of Natural History.

[9] Specimens in Carnegie Museum.

H. r. bicinctus.—VENEZUELA: Quebrada Arriba, Lara, 2 ♂, 3 ♀, 1 (?); Carora, 1 ♀, 1 (?); San Felipe, Yaracuy, 2 ♂; Nirgua, 1 ♂; Urama, Carabobo, 1 ♂, 4 ♀; La Victoria, Aragua, 1 ♂, 2 ♀; San Antonio de Yare, Miranda, 1 ♂; Carenero, 2 ♀; Tacarigua de Mamporal, 1 ♂; Barcelona, Anzoátegui, 1 ♂, 2 ♀; Puerto de la Cruz, 1 ♀; Cumaná, Sucre, 1 ♂, 1 ♀; San Antonio del Golfo, 2 ♀; Edo. Barinas, 2 ♂, 1 ♀; Guasdualito, Apure, 2 ♂, 3 ♀; El Baúl, Cojedes, 2 ♂, 1 ♀; Edo. Guárico, 7 ♂, 2 ♀; Maturin, Monagas, 1 ♂, 3 ♀, 2 (?); Terr. Delta Amacuro, 3 ♂, 3 ♀; Edo. Bolívar, 16 ♂, 12 ♀, 1 ♂ juv.; Terr. Amazonas, 2 ♂, 3 ♀.

H. r. stoicus.—VENEZUELA: Isla de Margarita, 9 ♂, 5 ♀, 2 (?).

Pteroglossus formosus Cabanis

Pteroglossus formosus Cabanis, Journ. Orn., p. 332, 1862. ("Venezuela".) Known only from the type in the Zoologisches Museum in Berlin, No. 9726. Prof. Dr. Erwin Stresemann wrote to us that it had been presented to the Museum by the botanist D. F. L. von Schlechtendal, probably before the year 1833; that it is marked as collected in Venezuela but that von Schlechtendal never went abroad and that he probably obtained the specimen from some collector; that the locality "Venezuela" is doubtful and that probably the type of *P. formosus* came from southeastern Brazil. Dr. Zimmer wrote to us that he believed that the supposed Venezuelan origin of the type was in error.

The range of the supposed species has also been given as Venezuela by Brabourne and Chubb (The Birds of South America, p. 158, 1912), Catalogue of Birds in the British Museum (*19*, p. 139, 1891) and Cory (Catalogue of Birds of the Americas, p. 368, 1919). Peters does not list the name in his Birds of the World.

Inasmuch as Cabanis, in the original description, made comparisons with *P. aracari* (Linné) and *P. wiedi* Sturm (a synonym of *P. aracari*) it is probable that the unique specimen of *P. formosus* is referable to one of the Brazilian subspecies of *P. aracari.* We deny the Venezuelan occurrence of the species.

Thripadectes flammulatus flammulatus (Eyton)

Anabates flammulatus Eyton, Contri. Orn., p. 131, 1849. ("New Grenada" = Bogotá.)

1 (?) imm., Río Chiquito, Hda. La Providencia, Táchira (southwestern), collected February 25, 1956; 1900 meters, in forest in Subtropical Zone.

This specimen, fully grown, extends the range of the subspecies from Colombia to Venezuela. It has been recorded from the Colombian part of nearby Páramo de Tamá.

The species has been hitherto known in Venezuela from at least four specimens of *T. f. bricenoi* Berlepsch from the páramos de la Culata, de Conejos and Escorial, in the Mérida Andes.

Thripadectes virgaticeps tachirensis, new subspecies

Type: From Río Chiquito, Hda. La Providencia, Estado Táchira, Venezuela; 2100 meters. No. 62178, Phelps Collection, Caracas. Adult male collected March 7, 1956, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *T. v. klagesi* (Hellmayr and Seilern) of the Central Coast Range of the Caracas region but has darker under parts, more ochraceous, less yellowish; a dusky wash across the breast; darker back, more brownish, less yellowish tint; rump and upper tail-coverts darker, more brownish, less reddish.

Range: Known from southwestern Táchira, in the Páramo Tamá region, in the forests of the Subtropical Zone at altitudes of 1250 and 2100 meters.

Description of Type: Top of head dark brownish olive, feathers with whitish shafts bordered by grayish, less dusky on nape; back nearest to Prout's Brown; rump and upper tail-coverts Burnt Sienna. Chin and throat nearest to Raw Sienna, feathers margined with blackish forming a diamond pattern, merging into the dusky olive breast and sides, these feathers with fine buffy shaft lines; this in turn merging into the more olivaceous abdomen; flanks and shanks more brownish; under tail-coverts more rufous olivaceous. Wings uniform with back; inner margins of remiges cinnamon, only basally on primaries; bend of wing, under wing-coverts and axillaries Xanthine Orange. Tail Mahogany Red, under surface paler and feathers with buffy shafts.

Bill (in life) "black"; feet "greenish gray"; iris "dark". Wing, 93 mm.; tail, 89; exposed culmen, 23; culmen from base, 27; tarsus, 26.

Remarks: Sexes alike. Size similar to *T. v. klagesi*. Range of measurements, including type: one adult male, see above; one adult female—wing, 86 mm.; tail, 88; culmen from base, 26. Measurements of *T. v. klagesi*: two adult males—wing, 86-90 (88); tail, 92-93 (92.5); culmen from base, 26; three adult females—wing, 87-88 (87.7); tail, 90-94 (92.3); culmen from base, 25-26 (25.7); one adult of undetermined sex—wing, 89; tail, 92; culmen from base, 25.

There are 12 additional specimens of *klagesi* from various localities in Perijá in the Pons Collection, Maracaibo, which we have not had occasion to examine.

Specimens Examined

T. v. virgaticeps.—ECUADOR: Quito, 1 (?)[10]; Gualea[8], 1 ♂, 1 ♀.

T. v. sumaco.—ECUADOR[8]: Sumaco Abajo, 2 ♂; Baeza, 1 ♀.

T. v. sclateri.—COLOMBIA: Bitaco Valley, Valle[9], 1 ♂, 1 ♀; La Cumbre, 1 ♀[9]; Salencio, Cauca, 1 ♀[8]; San Antonio[8], 2 ♂, 2 ♀, 1 (?); Ricaurte, Nariño, 1 ♀[8].

T. v. tachirensis.—VENEZUELA: Táchira: Río Chiquito, 1 ♂ (type); Cerro El Teteo, Burgua, 1 ♀.

T. v. klagesi.—VENEZUELA: Anzoátegui, Lara, 1 ♀[9]; Cumbre de Valencia, Carabobo, 1 ♀[8], 1 ♀[9]; Rancho Grande, Aragual, 1 ♂[10], 1 ♂[11], 1 ♀[11]; Colonia Tovar, 1 ♂, 1 ♀; Ño León, Dist. Federal, 1 ♂; El Junquito, 1 ♀, 1 (?); Ayapa, Perijá, Zulia, 1 ♀[12]; Jamayaujaina, 1 ♀[12]; Cerro Yamoré, 1 ♂[12].

---

[10] Specimens in U. S. National Museum.

[11] Specimens in Rancho Grande Biological Station.

[12] Specimens in Pons Collection, Maracaibo.

Vol. 71, pp. 125-132 Nov. 10, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SHRIMP OF THE GENUS PERICLIMENES FROM THE WEST INDIES

By Fenner A. Chace, Jr.
Smithsonian Institution, Washington, D. C.

The shrimp described below was first observed in 1954 by Harry Pederson of McAllen, Texas, who photographed its remarkable fish-cleaning habits at New Providence Island, Bahamas. Not until two years later were specimens collected by Conrad Limbaugh of the Scripps Institution of Oceanography, La Jolla, California, who is collaborating with Mr. Pederson on a study of fish cleaning by various marine shrimps.

Periclimenes (Periclimenes) pedersoni, n. sp.

Holotype.—Male; Lyford Cay, New Providence Island, Bahamas; August 1956; collected by Conrad Limbaugh; U. S. Nat. Mus. Cat. No. 101894.

Paratypes.—One ovigerous female; same locality as holotype (U. S. Nat. Mus.). One ovigerous female; same locality; August 8, 1957; collected by Conrad Limbaugh (U. S. Nat. Mus.). One male; small reef at north end of West Bay, Lyford Cay, New Providence, Bahamas; May 10-11, 1956; collected by Conrad Limbaugh (Acad. Nat. Sci. Philadelphia). One male, one female; old cement ship wreck, south shore of Hog Island, Nassau Harbor, Bahamas; May 19, 1956; collected by C. G. Chaplin and J. E. Böhlke (Acad. Nat. Sci. Philadelphia). Two males, three females (two ovigerous); Coral Harbor inside Lagoon Head, St. John Island, Virgin Islands; six to eight feet; April 24, 1958; collected by Conrad Limbaugh (U. S. Nat. Mus.).

Description.—Sexually dimorphic. Carapace of male (fig. 1) narrowed and bent upward in anterior two thirds, rostrum directed obliquely upward, barely or not reaching cornea of eye in adults, and unarmed ventrally; dorsal margin with three to five teeth, the first somewhat anterior to level of hepatic spine, the second just behind or just anterior to level of orbital margin. Carapace of adult female (fig. 3) not markedly narrowed or bent upward anteriorly; rostrum nearly horizontal, reaching to or beyond second segment of antennular peduncle, and armed with two to four ventral teeth in distal third; dorsal margin with five or six teeth, one slightly behind or slightly in front of level of hepatic spine, one just behind orbital margin, and three or four at slightly decreasing intervals on rostrum. Both sexes with hepatic spine prominent and outstanding (fig. 2). Antennal spine small. Lower orbital angle blunt and strongly produced.

Abdomen with all pleura rounded. Third somite produced medially as a prominent, slightly compressed cap overhanging base of fourth somite. Sixth somite of male nearly twice as long as fifth and distinctly longer than telson. Sixth somite of female usually less than twice as long as fifth and shorter than telson. Telson (figs. 5, 6) with two dorsal and three posterior pairs of spinules, both dorsal pairs posterior to middle of telson.

Eye with subglobular cornea. Eyestalk fully twice as long as cornea.

First segment of antennular peduncle long (fig. 2). Stylocerite outstanding but not reaching beyond middle of eyestalk. Outer margin of basal antennular segment slightly concave and terminating in a prominent anterolateral tooth, which falls far short of anterior end of segment. Anterior margin of segment strongly and acutely produced laterally as far as middle of second segment. Margin between anterolateral tooth and end of segment setose but unarmed. Second segment slightly shorter and broader than third. Upper antennular flagellum with branches fused for 12 to 18 joints; free part of shorter branch one fourth to one third as long as fused part and consisting of 4 to 7 joints.

Antennal scale reaching about as far as antennular peduncle, more than two and one half times as long as wide in males, slightly broader in females. Outer margin nearly straight. Outer spine falling far short of variably subtruncate distal margin of lamella. Antennal peduncle reaching to or beyond middle of antennal scale. Basal antennal segment with outer spine at juncture with scale.

Mouth parts as illustrated (figs. 7-12). Inner lacinia of second maxilla simple, not cleft. Caridean lobe of exopod of first maxilliped narrow, epipod hardly bilobed. Third maxilliped small, scarcely reaching end of antennal peduncle; terminal segment three fifths as long as penultimate and slightly more than half as long as antepenultimate; exopod clearly shorter than antepenultimate segment.

First pereiopod reaching beyond antennal scale by length of fingers to length of chela in males and by chela and at least one third of carpus in females; fingers (fig. 13) as long as palm; carpus distinctly longer than chela and subequal to merus. Second pereiopods unequal, especially in males. Larger one overreaching antennal scale by chela and from one third to more than two thirds of carpus; fingers two thirds as long as palm or slightly longer; cutting edge of movable finger with two to five and of fixed finger with one to four low denticles in proximal half (fig. 14); carpus about four fifths as long as chela; merus about nine tenths as long as, or subequal to, carpus; ischium from slightly shorter to slightly longer than merus. Smaller second cheliped overreaching antennal scale by chela and sometimes by one third of carpus; fingers more than three fourths as long as palm; cutting edges with fewer denticles than those of major chela; carpus from four fifths to nearly as long as chela. Third leg exceeding antennal scale by dactyl and at least half of propodus; dactyl (fig. 15) bifid, about four times as long as broad and about one fourth as long as propodus; propodus about one third again as long as carpus and five sixths as long as merus. Fifth leg exceeding antennal scale by dactyl and at least half of propodus. Legs increasing proportionately in length with growth.

Endopod of first pleopod of male (fig. 16) broadly rounded distally, without processes. Appendix masculina on second pleopod (fig. 17) nearly half again as long as appendix interna in adult males.

Color in life.—The following description is based on color notes made by Conrad Limbaugh from an ovigerous female taken at St. John, Virgin Islands.

General appearance transparent with opaque white antennae and white lines running along body. Dorsal surface of abdomen and tail fan with violet dots, the larger ones outlined in white. Third maxillipeds and both pairs of chelipeds white banded with violet and orange brown. Walking legs transparent, faintly violet when viewed over a white background.

Longitudinal white lines on body converging dorsally near posterior margin of third abdominal somite. Between white lines on back of abdomen are crowded violet dots of irregular sizes, about 12 on first somite, 9 on second, and 16 on third. Outside of white lines on each side of posterior two thirds of third abdominal somite are three similar small dots of violet followed by a large, triangular violet patch edged with white. Two medium-sized median dots on each of fourth and fifth somites and about five slightly smaller dots diverging posteriorly on either side of midline of sixth somite. These, together with about seven dots of various sizes on either side of median row on fourth and fifth somites, are set in slightly opaque, bluish white wash which grades to complete transparency laterally. End of telson white with about three dots and a transverse bar of violet. Distal half of inner branch of uropods with oval, blue-violet spot grading irregularly from white near edge to violet at center. Basal half with outer margin partially white, a violet dot just inside margin, and another violet spot at base. Outer branch of uropod with similar large, oval spot of violet and, proximad to it, two violet dots and one white one. An opaque white line on ventral surface of body from bases of walking legs to telson.

Eyes opaque, pink. Eyestalks white with short, white, transverse dash at base and purple line below. Two small white dots on either side of rostrum [perhaps on antennular peduncle]. Outer antennular flagellum white from base; inner flagellum transparent. Antennal flagellum mostly opaque white but transparent in basal part.

Third maxilliped white at base and tip, with six or seven violet bands between. First cheliped evenly banded with purple and white or bluish white; fingers tipped with brown. Second cheliped white with purple bands on distal half of fingers, distal half of palm, and distal half of carpus; brown saddles on inner surface at base of palm and in basal half of carpus; and numerous small purple saddles on inner surfaces of merus and ischium. Walking legs translucent pale violet when observed over a white background; region of thoracic attachment pale brown.

Eggs translucent yellowish brown.

Size.— The carapace of the male holotype is 4.5 mm. long to the orbital margin. The other males have carapace lengths of 3.0 to 4.6 mm. The females have carapace lengths of 3.6 to 6.5 mm.; they may be ovigerous at a carapace length of 3.8 mm.

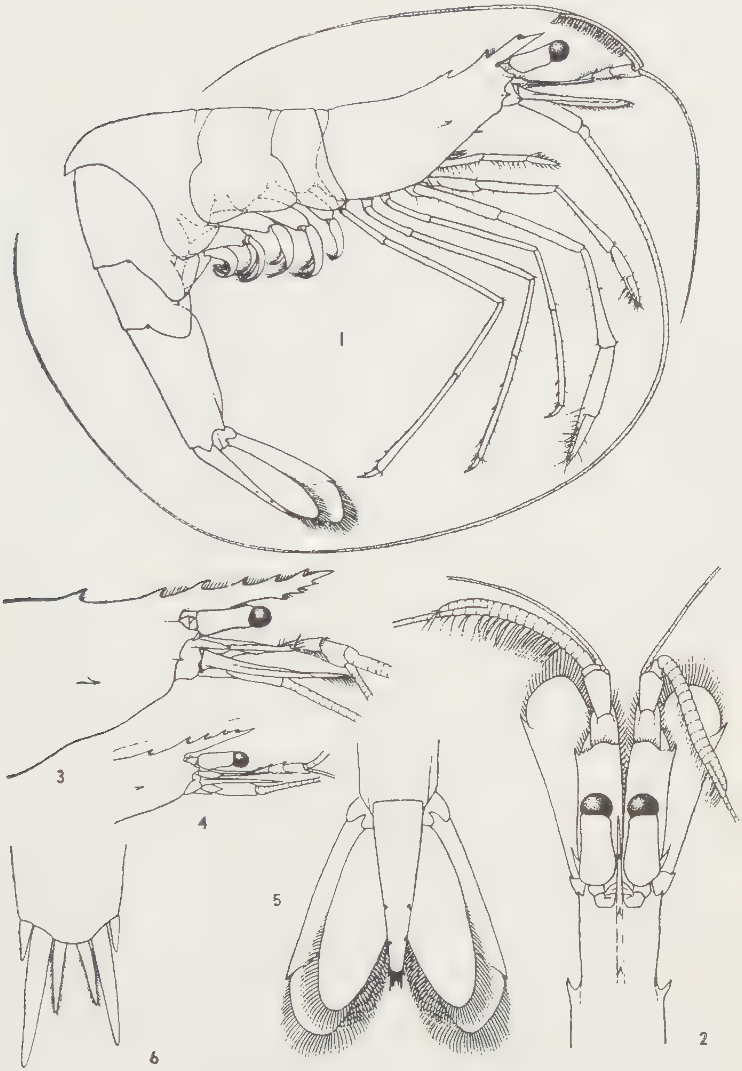
Ecology.—These shrimps were observed by Mr. Pederson and Mr. Limbaugh in two areas near New Providence Island, Bahamas: near Lyford Cay in depths of 5 to 18 feet and in Nassau Harbor from 5 to

30 feet. The species was also taken by Mr. Limbaugh at St. John, Virgin Islands, in depths of 6 to 8 feet. In general, it occurred in localities protected from violent surge. In every instance, the individuals were associated with the sea anemone *Bartholomea annulata,* either hanging directly from the anemone or on objects nearby. Also associated with this anemone, in a complex and variable pattern, were a red mysid, *Heteromysis actiniae,* the closely related spotted cleaning shrimp, *Periclimenes yucatanicus,* the purple snapping shrimp, *Alpheus armatus,* hermit crabs, the arrow crab, *Stenorynchus seticornis,* and two fishes, *Paraclinus grandicornis* and an apogonid. *Periclimenes pedersoni* generally occurs singly, but sometimes in pairs, and occasionally in groups of as many as five individuals with a single anemone. Ovigerous females were present during the entire period of observation, from April through early August. The shrimps usually remained with the same anemone for from one to three weeks, and probably longer, but occasionally they disappeared completely or appeared a short distance away on another anemone. The fish-cleaning habits of the species will be discussed in a forthcoming paper by Limbaugh, Pederson, and Chace.

Remarks.—*P. pedersoni* is closely related to *P. yucatanicus* (Ives), a species with similar habits that occurs more commonly in the same region. The two species may be distinguished by the following characters:

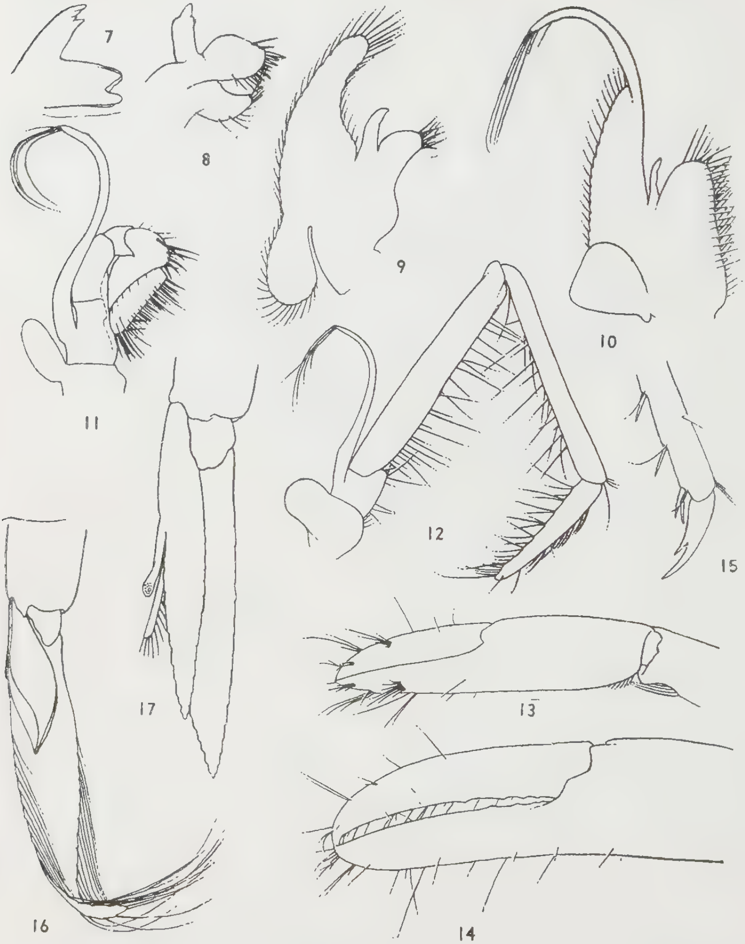
P. pedersoni	*P. yucatanicus*
Sexually dimorphic.	Not noticeably dimorphic.
Rostrum of female with 5-6 dorsal teeth.	Rostrum of female with 7-9 dorsal teeth.
First segment of antennular peduncle with 1 anterolateral spine.	First antennular segment with 3-4 anterolateral spines.
Pereiopods slender; carpus of second cheliped nearly as long as chela.	Pereiopods stouter; carpus of second cheliped little more than half as long as chela.
Marked with blue and white stripes and spots; antennae white; walking legs transcluent pale violet.	Marked with a few opaque white and tan spots; antennae white with red bands; walking legs purple with white bands.

The sexual dimorphism of *P. pedersoni* is less apparent in small specimens. Young males (fig. 4) resemble the females in having the rostrum longer and with more numerous dorsal teeth; young females resemble the males in having the rostrum directed obliquely upward and the ventral margin less distinctly dentate.



Periclimenes (Periclimenes) pedersoni

Fig. 1. Male holotype from right side. x 5.
Fig. 2. Anterior part of holotype in dorsal view. x 7.5.
Fig. 3. Anterior part of female paratype from Bahamas. x 5.
Fig. 4. Anterior part of male paratype from Virgin Islands. x 5.
Fig. 5. Tail fan of holotype. x 7.5.
Fig. 6. End of telson of holotype. x 50.



Periclimenes (Periclimenes) pedersoni

Fig. 7. Right mandible of holotype. x 30.
Fig. 8. Right first maxilla of holotype. x 30.
Fig. 9. Right second maxilla of holotype. x 30 .
Fig. 10. Right first maxilliped of holotype. x 30.
Fig. 11. Right second maxilliped of holotype. x 30.
Fig. 12. Right third maxilliped of holotype. x 25.
Fig. 13. Chela of right first pereiopod of holotype. x 25.
Fig. 14. Fingers of right second pereiopod of holotype. x 25.
Fig. 15. Dactyl of right third pereiopod of holotype. x 25.
Fig. 16. Right first pleopod of holotype. x 25.
Fig. 17. Right second pleopod of holotype. x 25.

Vol. 71, pp. 133-142 Nov. 10, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW NEOTROPICAL VELIIDAE (Hempitera)

By Carl J. Drake
Smithsonian Institution, Washington, D. C.

The present paper comprises the descriptions of one new species of the genus *Husseyella* Herring, four new species of the genus *Rhagovelia* Mayr and illustrates the type of *Rhagovelia traili* (Buchanan-White) from South America. The types of the new species are in the Drake Collection (U. S. N.M.). Mr. Arthur Smith of the British Museum made figure 1; the rest of the illustrations were drawn by Mrs. Jerry Rozen, Alexandria, Virginia.

Rhagovelia traili (Buchanan-White) (Fig. 1)

Neovelia traili Buchanan-White, 1879. Journ. Linn. Soc. 14:487.

The type, brachypterous, Manaos, Brasil, in British Museum, is figured. As this species is unknown to American workers, the illustration (Fig. 1) will be of much help in identifying the species.

Husseyella halophila sp. nov.
(Fig. 2 & 3*a* & *b*)

Small, subovate, apterous, blackish brown with the short, transverse band (as wide as vertex) near middle of anterior lobe of pronotum and a U-shaped mark at base of head (arms projecting anteriorly next to eyes) reddish brown; entire dorsal surface densely pubescent and interspersed with numerous dark hairs, the hairs on sides of thorax and abdomen a little longer and stiffer than on dorsal surface; body beneath bluish black. Legs dark brown with coxae, trochanters, bases of upper and under surfaces of all femore testaceous. Antennae dark brown with basal fourth of first segment testaceous. Length 2.25 mm. (male) and 2.50 mm. (female), with 1.10 mm. (male) and 1.30 mm. (female, across base of pronotum.)

Head with median, longitudinal, impressed line. Antennae (Fig. 3*a*) with three, subbasal, moderately long, dark, bristly hairs on second segment, and a subbasal and another bristly hair near the middle of second segment, measurements: I, 0.33 mm.; II, 0.35 mm.; III, 0.52 mm.; IV, 0.45 mm. Pronotum (Fig. 2) (male, cleared) nearly twice as wide (across widest part of hind lobe) as long, composed of two fairly distinct lobes, with fore lobe a little shorter than hind lobe; front

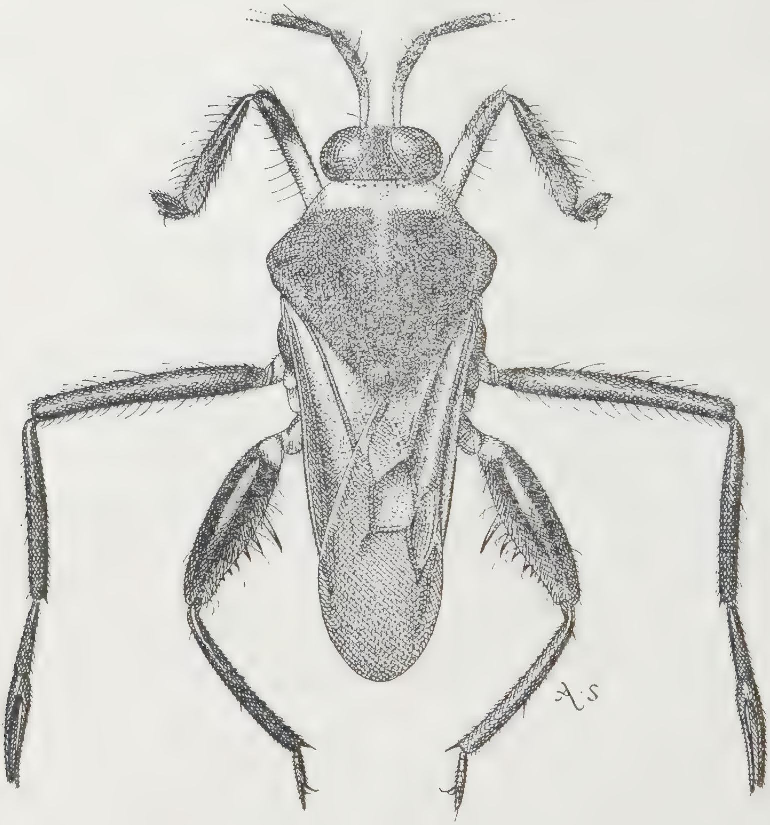


Fig. 1. *Rhagovelia traili* (Buchanan), type

lobe with a transverse row of punctures near hind margin and with collar set-off by an encircling row of punctures, otherwise impunctate; hind lobe with many deep punctures; mesonotum represented on each side by a short triangular plate; metanotum about one-third as long as pronotum, with punctures about the same as in hind lobe of pronotum. Abdomen tapering posteriorly with the connexiva slightly wider in female than in male. Legs unarmed in both sexes; femora only slightly swollen; anterior tarsi strongly swollen; apices of hind femora not reaching to apex of genital segments; tarsi of middle legs as in illustration (Fig. 3*b*). Alate form unknown.

Holotype (male) and *allotype* (female), Santa Catarina, collected on the quiet, salty waters of a small stream flowing into the Atlantic Ocean. *Paratypes:* 12 specimens, collected with the type in eastern Santa Catarina, Brasil. Many nymphs in various stages of development were also taken.

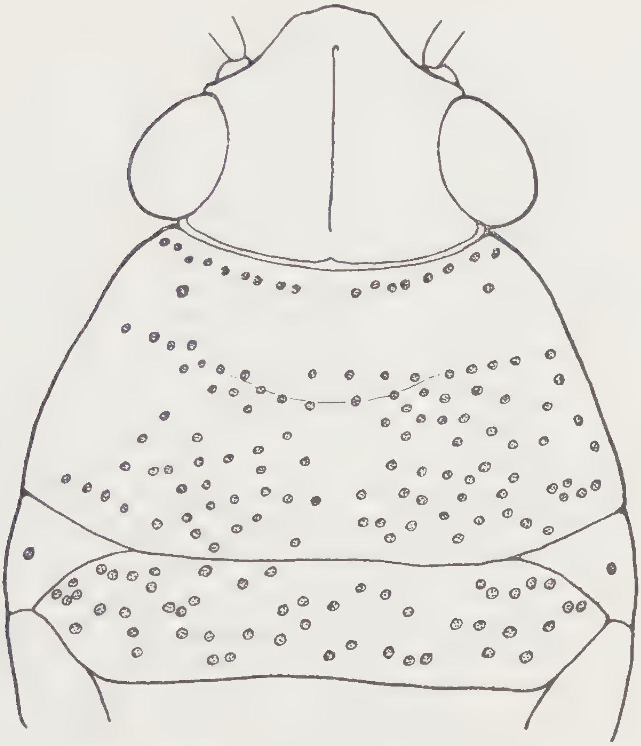


Fig. 2. *Husseyella halophila*, n. sp., pronotum (cleared).

Differs from *H. diffidens* also an inhabitant of Brasil, by the longer hairs on dorsal surface, more shaggy appearance, shorter antennae and measurements of middle tarsi as noted under *H. diffidens.*

Husseyella diffidens (Drake and Harris)

Microvelia diffidentis Drake & Harris, 1933. Proc. Ent. Soc. Wash. 46:52.

Original characterized from five females (*holotype* and four paratypes), Sao Matheos, Brasil. The male (allotype) is slightly smaller than the female, but the color, markings and vestiture are quite similar. The connexiva are reddish brown and clothed with moderately long, dark hairs. The reddish brown markings are the same as in female. Antennal measurements: segment I, 34; II, 32; III, 50; IV, 40. Middle legs with tarsal segment I longer than II (38:30).

The antennae of *diffidens* (1.95 mm.) is longer than in *haplophyla* (1.65 mm.); tarsi of middle legs also longer (0.85 mm. to 0.62 mm.); and besides the dorsal surface is not so shaggy. In both species the last segment of the middle tarsi is provided with four bladelike structures instead of claws (Fig. 3*b*).

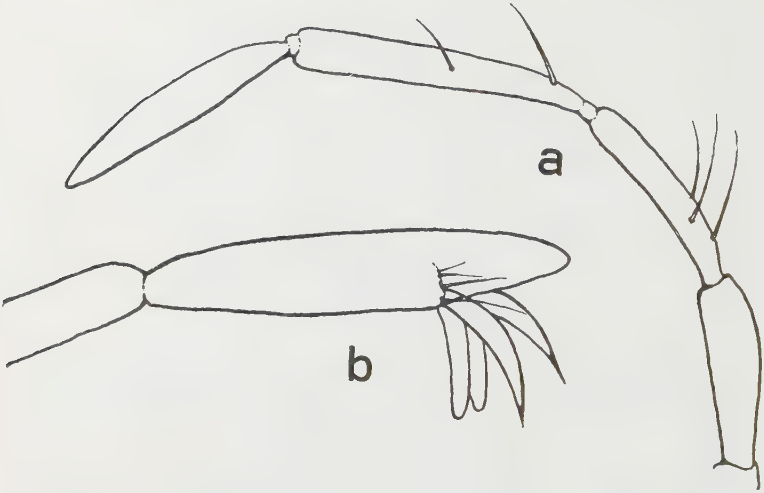


Fig. 3. *Husseyella halovelia,* n. sp.: *a,* antenna & *b,* last tarsal segment of middle leg.

Rhagovelia thaumana, sp. nov. (Fig. 4*a*)

Small, blackish with transverse, subapical, orange band of pronotum interrupted at middle and as wide as vertex; pubescence short, grayish brown. Antennae shortly pubescent, deep black, shining, with basal two-fifths of first segment pale testaceous. Legs deep black, shining, with inferior parts of acetabula, coxae and trochanters of fore and hind legs pale testaceous; middle legs entirely deep black. Last dorsal tergite and sometimes also a spot on preceding segment shining black. Body beneath quite bluish. Length 2.50 mm., width 1.10 mm. male and 1.30 mm. female. Alate form unknown.

Male: Head with the usual impressed, median line and basal marks; labium black-fuscous, shining, reaching a little beyond prosternum. Antennae with bristly black hairs on first two segments, measurements: I, 0.70 mm.; II, 0.41 mm.; III, 0.42 mm.; IV, 0.41 mm. Pronotum very short, not as long as an eye. Mesonotum depressed, especially beyond the middle, shorter than wide (55:75) obliquely converging behind humeri, apex broad and subtruncate; exposed part of metanotum about as long as a tergite. Abdomen strongly tapering apically, last tergite about one-third as wide as basal width, beneath without spine or median carina; connexiva reflexed obliquely upright outwardly, not abruptly narrowed on last two segments. Anterior femur 1.80 mm. long; tibia 0.86 mm. long, scarcely dilate apically, feebly flattened apically beneath. Middle legs with femur 1.80 mm. long; tibia 1.10 mm. long; tarsal segments II and III subequal, each 0.60 mm. long. Hind femur distinctly slenderer than in middle leg, 1.05 mm. long, scarcely swollen, armed barely behind middle of ventral surface with a fairly long spine, followed between there and apex with four or five very short

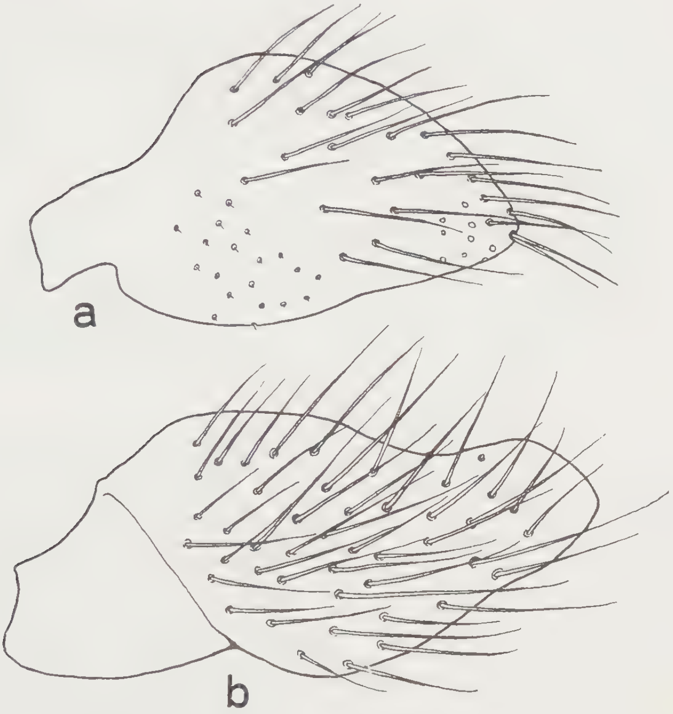


Fig. 4. Right male paramere: *a, R. thaumana,* n. sp. & *R. yacuivana,* n. sp.

spines, the base of first spine (when leg is fully extended along side of abdomen) distinctly surpasses the last tergite; tibia straight, without apical spur or ventral teeth, 1.25 mm. long. Paramere as in Figure 4*a*.

Female: Broader than male, with mesonotum, metanotum and abdomen (above and beneath) greatly modified, very different from that of any other member of the genus. Color and markins (orange pronotal spot larger) and antennal measurements nearly same as in male. Pronotum almost as long as an eye. Mesonotum strongly modified posteriorly, deflected almost vertically downward posteriorly from behind middle of disc, with a patch of long, brown, reclining hairs on disc (in front of deflection), the tips of which project apically beyond the deflection; metanotum very short, with exposed part on a lower level than that at apex of the deflected posterior part of mesonotum.

Abdomen strongly depressed, with tergites on a lower horizontal level than that of hind part of mesonotum, somewhat troughlike; connexiva wide, upright at base, with last three segments convexly curved inward, slightly widened and with outer edges there in contact or nearly so within, the long brown hairs on outer edge of connexiva longer and quite abundant on last three segments; beneath convexly tectiform, indistinctly ridged and provided with pale hairs on median line. Mesosternum very long, strongly impressed on each side opposite metasternal acetabulum; abdomen beneath 0.55 mm. long, with last ventrite at middle, behind emarginate. Hind legs with femur short, slender, not as thick as middle femur, with apex surpassing last genital segment, armed beneath on apical third with three or four very short spines.

Holotype (male) and *allotype* (female), Linha Facao, Mineral Waters, Santa Catharina, Brasil, May, 1957. *Paratypes:* 20 specimens, taken with type.

This species is closely allied to *R. paulana* Drake, though the females are easily distinguished from each other. The male of *R. thaumana*, n. sp. is slightly broader and more depressed above, and with the first spine on hind femora surpasses last abdominal tergite when legs are extended and held parallel along sides of the female abdomen. *R. paulina* is longer, abdomen much longer, and with neither pronotum nor abdomen as greatly modified as in *thaumana.*

Rhagovelia sabrina, sp. nov. (Fig. 5*a*)

Grayish black with a large, discal, triangular spot of mesonotum, a small, median, basal spot on pronotum and a large spot on each dorsal tergite of abdomen black and shining. Legs black, slightly shining; coxae and inferior part of acetabula of both fore and hind legs flavotestaceous. Antennae blackish with basal third of first segment testaceous. Body beneath bluish black. Length 3.50 mm, width 1.25 mm. (male) and 1.50 mm. (female).

Head with impressed, median, longitudinal line and usual basal impression. Antennae clothed with short, brownish pubescence and usual bristly hairs on first two segments, measurements: I, 95; II, 50; III, 50; IV, 40. Pronotum very short, not longer than length of an eye, with short, transverse, brownish band not prominent and not wider than width of vertex and divided at middle; mesonotum large, convex, wider across humeri than median length (100:80 male and 110:80 female) with lateral sides behind humeri obliquely converging posteriorly and with apex broad and truncate; mesonotum very short. Abdomen tapering posteriorly, more strongly so behind fourth tergite, with connexiva terminating in an acute angle, not produced beyond seventh tergite. Legs long, slender, femora not swollen in either sex.

Male: Connexiva slightly narrower than in female. Hind femora quite slender, with apices scarcely reaching apex of genital segment, armed beneath with a rather short, backwardly curved spine at basal fourth and then followed by two or three shorter ones; tibiae without ventral teeth, with a short, straight, apical spur. Anterior tibiae scarcely dilate, slightly flattened beneath on apical fourth, with short apical comb.

Female: Stouter than male. Hind femora and tibiae unarmed. Other characters as in male. Macropterous forms unknown.

Rhagovelia stibea, new sp. (Fig. 5*b*)

Black, slightly bluish, especially beneath, without black spots on dorsal tergites; pronotum short, not longer than an eye, with entire median part (slightly wider than vertex) yellowish orange; antennae blackish fuscous, with basal half of first segment pale testaceous. Inferior margin of all acetabula, all coxae, all trochanters and the basal half of

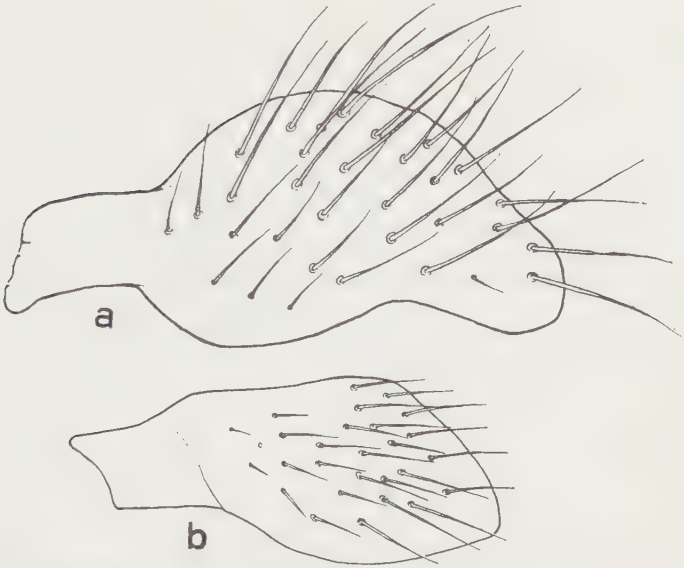


Fig. 5. Right male paramere: *a, R. sabina,* n. sp. & *R. stibea,* n. sp.

fore femora pale testaceous. Pubescence on dorsal surface very short, grayish black, without longer hairs. Narrow margin of connexiva black (in one paratype partly brownish). Alate form unknown. Length, 2.30-2.50 mm.; width 0.94-1.00 mm.

Male: Head with median, longitudinal, black line and usual basal impressions. Antennae pubescent, without longer hairs, except for bristly hairs usually found on first two segments, measurements: I, 0.65 mm.; II, 0.28 mm.; III, 0.38 mm.; IV, 0.35 mm. Pronotum very short, with hind margin sinuate. Mesonotum covering most of metanotum, feebly convex, 0.80 mm. long and 0.45 mm. wide, strongly concavely narrowed behind humeri, with apex wide, subtruncate and slightly less than one-third of humeral width. Abdominal tergites tapered evenly posteriorly, with apex about one-third as wide as base; connexiva reflexed obliquetly upright laterally, more strongly narrowed on last three segments, with last segment ending in an acute angle at apex of last tergite. Abdomen beneath without median carina or spine. All coxae and trochanters unarmed. Fore tibia feebly dilate, not scooped out but flattened beneath apically, 0.70 mm. long, feebly longer than femur. Middle legs with femur 1.40 mm. long, tibia 1.00 mm., tarsal segment II 0.52 mm. long and III 0.52 mm. Hind femur 1.00 mm. long, scarcely more than one-third as thick as long, armed beneath with a long spine at basal five-eighteenths, thence to apex with seven to nine shorter spines gradually diminishing in length; tibia 1.20 mm. long, straight, armed on basal half beneath with a row of closely-set, very short, stout, blunt, teeth.

Female: Slightly stouter but with the general aspect, color, markings, antennae and pronotum as in male. Connexiva fairly wide, moderately

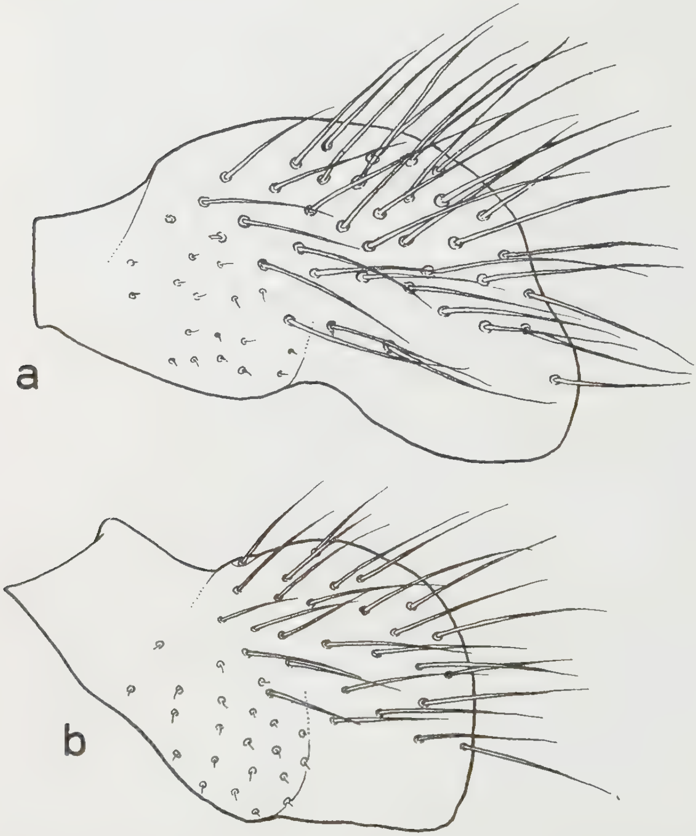


Fig. 6. Right male paramere: *a, R. janeira Drake & R. hambletoni* D. & H.

narrowed apically, turned upright posteriorly from base of tergite V, truncate at apex. Hind femora not as swollen as in male, armed at apical seven-sixteenths with a long spine, between there and apex with 5 or 6 smaller spines, all spines slightly bent posteriorly and testaceous with black tips. Other structures very similar to those in male.

Holotype (male) and *allotype* (female), Canal Zone, Panama, Feb. 10, 1939, C. J. Drake. *Paratypes:* 6 specimens, same data as type.

Very similar in size and general aspect to *R. evidis* Bacon, but really separated from it by having the entire median longitudinal part of pronotum (as wide as vertex) yellowish orange, lack of black spots on abdominal tergites and the position and number of spines on hind femora; the hind tibiae on basal half beneath armed in both sexes with short, blunt, inconspicuous teeth.

For comparative purposes, the right male paramere of *R. janeira*

Drake (Fig. 6*a*) and *R. hambletoni* Drake & Harris (Fig. 6*b*) have been illustrated. Chaetotaxy of the male parameres provides good taxonomic characters in the Genus *Rhagovelia.*

Rhagovelia yacuivana, new sp. (Fig. 4*b*)

Grayish-black, slightly bluish, more bluish beneath; pronotum short, not longer than an eye, with transverse orange stripe not divided and as wide as vertex at base of eyes; labium blackish with base and juga brownish testaceous. All acetabula, all coxae, all trochanters, anterior half of fore femora and sometimes basal part of inferior surface of hind femora brownish testaceous. Antennae dark fuscus with basal third of first segment brownish testaceous or testaceous. Length, 3.57-4.00 mm.; width, 1.65 mm.

Male: Head with impressed, median, longitudinal lines and usual basal marks. Antennae shortly pubescent hairs on inner face of first two segments, measurements: I, 0.90 mm.; II, 0.52 mm.; III, 0.60 mm.; IV, 0.52 mm. Mesonotum slightly convex, obliquely narrowed on each lateral side behind humeral angles, with apex subtruncate and about one-third as wide as at humeral angles; metanotum very short, subtruncate behind. Dorsal surface of thorax and abdomen provided with some short golden pubescence interspersed with longer, erect, dark hairs.

Abdomen slowly narrowed posteriorly, with tergite II about twice as wide as VII; connexivum narrowed posteriorly, reflexed obliquely upright laterally, with last three segments more sharply narrowed, terminating in an acute angle opposite apex of last tergite. Venter plump, without median carina. Anterior tibia 1.20 mm. long, feebly dilate apically, flattened beneath apically, these with short shallow groove subequal to femur in length. Middle leg with femur 2.10 mm. long, tibia 1.50 mm., tarsus II 0.90 mm. and III 0.85 mm. Hind femur 1.60 mm. long, slightly swollen at thickest point, scarcely thicker than middle femur, armed at basal third with a long spine, thence to apex with much shorter spies; tibia straight, unarmed, with a short, straight spur at apex.

Female: Slightly stouter than male; color, markings, antennae, connexiva and fore and middle legs about same as in male. Trochanters unarmed. Hind femur scarcely as thick as middle femur, equipped with a moderately long spine at apical third, thence to apex with 4 or 5 much shorter spines; hind tibia unarmed, with short apical spur. Hind femora, both male and female, only feebly thicker than intermediate ones. Alate female 4.25 mm. long. Pronotum moderately convex across humeral angles, 1.65 mm. long and 1.75 mm. wide at humeri. Hemelytra dark fuscous brown or blackish brown with veins darker.

Holotype (male) and *allotype* (female), both apterous, Yacuiva, Bolivia, Aug. 1917 (ex. Pennington Coll.) *Paratypes:* 4 specimens same data as type, 6 specimens, Piquate, Salta, Arg., Aug., 1934; and 24 specimens Santa Cruz, Bol., Oct. 17, 1957.

About the same size, color, markings and general appearance as *R. velocis* Drake and Harris. It differs, however, in having the male parameres broadly rounded at apex (not pointed as in *veloicis*), shorter and thinner hairy vestiture of dorsal surface, shorter bristly hairs on legs, slightly differently shaped hind femora and distinctly shorter abdomen in male.

Vol. 71, pp. 143-148 Nov. 10, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON THE OCCURRENCE OF AGROTHRIPS IN ILLINOIS AND KANSAS, WITH A REVIEW OF THE NORTH AMERICAN SPECIES

(Thysanoptera: Phlaeothripidae)

Lewis J. Stannard, Jr.
Illinois Natural History Survey, Urbana

Until recently thrips of the genus *Agrothrips* in North America had been found solely in the grasslands of western United States and Mexico. It came, therefore, as a considerable surprise when in 1956 a species of this genus was taken abundantly in pastures at Sheldon, Illinois. Because the closest known record of the species involved was from Colorado, I made particular effort during a collecting trip in 1957 through Iowa, Nebraska, Kansas, and Missouri to obtain further information on the distribution of *Agrothrips*. The Illinois species of *Agrothrips* was not encountered, but at Minneapolis, Kansas, additional specimens of a new species previously known to me from New Mexico were discovered.

In order to identify and to categorize these two species of *Agrothrips* it has been necessary to review the North American members of the genus.

Acknowledgment is gratefully made to Miss Kellie O'Neill of the U. S. National Museum for the loan of two paratypes of *Agrothrips omani* (Crawford).

Agrothrips Jacot-Guillarmod

Agrothrips Jacot-Guillarmod (1939:40). Type species by original designation.—*Agrothrips priesneri* Jacot-Guillarmod . Zululand.

Head much longer than wide, smooth, just slightly constricted behind the eyes. Eyes moderate in size, not prolonged posteriorly on the ventral surface more than on the dorsal surface. Ocelli present or absent. Postocular setae moderately developed, pointed to dilated. Antennae eight-segmented; segment III swollen near the base into a shelflike ring, fig. 2, sense cones difficult to observe; segments VI and VII with or without well defined pedicels; segment VIII broadly attached to segment VII. Mouth cone short, broadly rounded. Maxillary stylets slender, when retracted forming a V within the head. Maxillary bridge broad.

Prothorax smooth, always with anterolateral and major posterior setae well developed, usually blunt to dilated; anteromarginal and midlateral setae minute except in the case of *tenebricosus* in which the midlateral setae are moderately long. Epimeral sutures complete. Praepectal plates present. Meso- and metanotum fused or not fused. Metanotum usually smooth. Macropterous, brachypterous, or apterous. Fore wings when present narrowed beyond the middle, with accessory fringe cilia. Fore tarsi each with or without a small tooth.

Pelta usually in the form of a broad triangle, smooth. Abdominal tergite IX with major median posterior setae shorter than or longer than the tube. In males, abdominal sternite VIII with or without a differentiated glandular area; abdominal tergite IX with major lateral posterior setae reduced in size. Tube much shorter than head, not thickened or ridged.

Agrothrips is similar to *Haplothrips*, especially the subgenus *Karnyothrips*, differing principally by the form of antennal segment III. In *Agrothrips* antennal segment III has a thickened shelflike ring at the base just above the pedicel, fig. 2, whereas in *Karnyothrips* segment III gradually tapers to the pedicel.

As I have mentioned elsewhere (Stannard 1957), the name *Agrothrips* may or may not apply to the North American species. Even so this name can be used without bringing undue confusion to any system of classification because all the species, at least those from the Nearctic and the Ethiopian regions, are apparently closely related. Point by point the African type species, *priesneri*, is remarkably similar to some of our species except for a single feature, the fusion of the meso- and metanotum, a feature of degeneration that may be merely the result of extreme apterism.

The North American species of *Agrothrips* can be separted into two groups.

Group 1 can be characterized as having (a) the major median posterior setae on abdominal tergite IX longer than the tube, (b) a glandular area present on abdominal sternite VIII in the male, and (c) a slender form. This group includes *arenicola*, *tantillus* n. sp., and *pallidus*. The African type species, *priesneri*, belongs nearest the aforementioned species on the basis of the predominantly yellow color, long setae on abdominal tergite IX, and by the slender appearance. The original description of *priesneri* does not indicate whether or not the male possesses a glandular area on abdominal sternite VIII.

Group 2 can be characterized by having (a) the major median posterior setae on abdominal tergite IX shorter than the tube, (b) by lacking a glandular area on abdominal sternite VIII in the male in those species in which the male is known, and (c) a more robust form than do species belonging to group 1. Group 2 includes *dimidiatus*, *omani*, and *tenebricosus*.

KEY TO THE NORTH AMERICAN SPECIES

(based in part upon information in the literature)

1. Antennae completely dark brown; midlateral prothoracic setae well developed .... **tenebricosus**

Antennae with several segments yellow; midlateral prothoracic setae minute 2

2. Antennal segment I brown .... **omani**

Antennal segment I yellow 3

3. Abdomen predominantly yellow 4

Abdomen predominantly brown 5

4. Postocular and major prothoracic setae blunt to dilated; abdominal sternite VIII in the male with glandular area stated to be unlike that in *arenicola* (Hood 1938) .... **pallidus**

Postocular and major prothoracic setae pointed; abdominal sternite VIII in the male with a medially divided, transverse glandular area .... **arenicola**

5. Antennae with intermediate segments yellow; abdominal tergite IX with major median posterior setae shorter than the tube; abdominal sternite VIII in the male without a glandular area .... **dimidiatus**

Antennae with intermediate segments, except III, light brown; abdominal tergite IX with major median posterior setae longer than the tube; abdominal sternite VIII in the male with a transverse glandular band .... **tantillus**

Agrothrips arenicola (Hood)

Karnyothrips arenicola Hood (1938:216). ♀, ♂. Type locality.—Aguila, Arizona.

Diagnosis (summarized from original description): Known only by the brachypterous form. Color nearly uniformly ochraceous yellow with antennal segments IV to VIII uniformly light brown, antennal segments IV to VII scarcely pedicellate. Ocelli absent. Postocular setae pointed. All prothoracic setae pointed. Fore tarsi each persumably armed with a small tooth.

Only the 16 specimens from the type locality are recorded in the literature. These were taken from the grass *Hilaria rigida.*

I have not seen this species. It has never been illustrated.

Agrothrips dimidiatus (Hood)

Watsoniella dimidiata Hood (1939:576). ♀, ♂. Type locality.—Tivoli, Texas.

Diagnosis: Known only by the macropterous and brachypterous forms. Bicolored, with antennal segments I, and III to VI, legs, thorax, and abdominal segment I, yellow; the remainder of the abdomen dark brown, head and antennal segment II yellowish brown, and antennal segments VII and VIII brown. Wings when present colorless. Ocelli present. Postocular setae pointed to blunt. All well developed major prothoracic setae blunt to dilated. Fore tarsi each armed with a small tooth.

In the original description specimens were recorded from Tivoli, Bay City, and Palacios, Texas, collected mostly from grass. Before me are two brachypterous females from Lawrence, Kansas, taken in a prairie meadow. My previous apparent record of this species from Illinois (Stannard 1957) was the result of a typographical error.

Agrothrips omani (Crawford, J. C.)

Haplothrips (*Hadothrips*) *omani* Crawford, J. C. (1947:250). ♀. Type locality.—Tucson, Arizona.

Diagnosis: Known only by the apterous form which is not particularly degenerate. Color generally dark brown except for antennal segments III to VI, apical portions of tibiae and all tarsi which are predominantly yellow. Ocelli present. Postocular setae pointed to blunt. All well developed major prothoracic setae blunt to dilated. Abdominal sternite VIII in the male (newly discovered in Illinois) without a glandular area.

Originally described from Tucson, Arizona, on Johnson grass, this species is now known from Springfield, Colorado, on range grass (INHS collection) and from Sheldon, Illinois.

The Illinois specimens, which were erroneously cited as records of *dimidiatus* (Stannard 1957), have been compared with paratypes of *omani* and have been found to be conspecific. In view of the possibility that the Illinois population is an isolated colony confined to a heavily grazed pasture area that contains few native plants, and because this population is so far out of the expected range of species in the genus, it may be presumed that *omani* of Illinois has descended from introduced stock. Attempts to secure additional specimens of *omani* from other sections of Illinois and from Missouri, Kansas, Nebraska, and Iowa have failed.

Agrothrips pallidus (Hood)

Zygothrips pallidus Hood (1912:140). ♀, ♂. Type locality.—Brownsville, Texas.

Diagnosis (summarized from original description): Known only by the brachypterous form. Color almost entirely clear, bright lemon-yellow except for antennal segments VII and VIII which are shaded with brown and except for the apical three-fourths of tube which is abruptly nearly black. Ocelli present in the female, absent in the male. Postocular setae blunt. All well developed major prothoracic setae blunt to slightly dilated. Fore tarsi each armed with a small tooth.

Although not so stated in the original description, it could be concluded by the inference given in the diagnosis of *arenicola* (Hood 1938) that the male of *pallidus* bears a glandular area on abdominal sternite VIII. Most likely this species has the median setae on the posterior margin of abdominal tergite IX longer than the tube.

The recorded specimens were taken at Brownsville and Padre Island, Texas, in grass, in one case Bermuda grass.

Hood (1912) illustrated the head, prothorax, and antennae.

I have have never seen this species.

Agrothrips tantillus new species

Female (apterous).—Length distended about 1.7 mm. Bicolored brown and yellow. Head, except sometimes posterior portion; antennal segments I and III, thorax, legs, and anterior portion of abdominal segment I, yellow. Remainder of abdomen and antennal segments IV to VIII, brown; tube and unguitractors of legs, dark brown; head in posterior half and sides of antennal segment II sometimes lightly shaded with brown.

Head, fig. 1. Ocelli absent. Postocular setae dilated. Antennal segment VI with a distinct, narrowed pedicel. Maxillary bridge considerably forward of the posterior margin of the head.

Prothorax with those major setae which are well developed dilated; anteromarginal and midlateral setae minute. Pterothorax degenerate but with a well defined suture between the meso- and metanotum. Wings and wing pads lacking. Fore tarsi each apparently unarmed.

Pelta broad nearly forming an isoscelese trapezoid. Wing-holding setae not differentiated. Abdominal tergite IX with major posterior setae longer than the tube, pointed. Tube much shorter than the head.

Male (apterous). — Length distended about 1.3 mm. General color and structure similar to female. Abdominal sternite VIII with a narrow, complete, transverse glandular band, fig. 3. Abdominal tergite IX with major lateral posterior setae reduced in size.

Holotype.—Female; Minneapolis, Kansas (Rock City State Park); June 24, 1957; Evers and Stannard; from clumps of *Andropogon*. **Allotype.**—Male; same data as for holotype. **Paratypes.**—1♂,same data as for holotype. 1♀, 12.4 mi. so. of Hatch, New Mexico, along Rio Grande; November 27, 1949; C. C. Hoff; in rotten cottonwood stump. 7♀, 1♂; 5 mi. w. of Albuquerque, New Mexico; November 6, 1954; C. C. Hoff; from roots of grasses and semi-arid plants. Types deposited in the collection of the Illinois Natural History Survey.

This species is a member of Group 1. It can be differentiated at once from the other members of this group, *arenicola* and *pallidus*, by the dark colored abdomen. In the characteristics of the longitudinally elongated prothorax and the degeneration of the pterothorax, *tantillus* tends to resemble the type species, *priesneri*.

Some paratypes of *tantillus* from New Mexico have the head slightly shaded with brown whereas the specimens of the type series from Kansas have the head entirely yellow.

Agrothrips tenebricosus (Priesner)

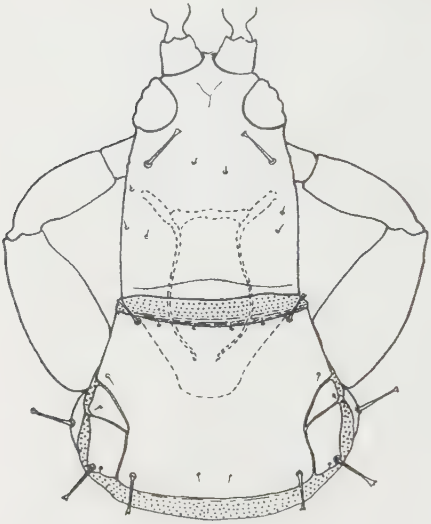
Haplothrips (*Hadothrips*) *tenebricosus* Priesner (1925:318). ♀. Type locality.—Los Reyes, Distrito Federal, Mexico.

Diagnosis: Known only by the apterous form which is not particularly degenerate. General color almost entirely dark brown except the tip of the fore tibiae and all tarsi which are yellow or nearly yellow. Ocelli lacking. Postocular setae dilated. All well developed major prothoracic setae (including the midlateral setae), dilated. Fore tarsi unarmed. Male unknown.

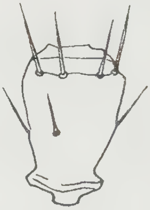
The types which were found near Mexico City in a short grass meadow are the only specimens so far collected. In 1955 I studied one of the two original females deposited in the Priesner collection. The head, prothorax, and antennal segment III have been illustrated (Stannard 1957).

LITERATURE CITED

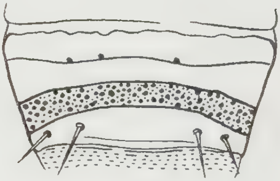
Crawford, J. C.
1947. A new species of the genus Haplothrips subgenus Hadothrips



1



2



3

EXPLANATION OF FIGURES

Agrothrips tantillus new species. Fig. 1. Head, prothorax, and fore legs, dorsal aspect, leg setae omitted. Fig. 2. Antennal segment III of right antenna. Fig. 3. Abdominal sternite VIII of male showing glandular area.

(Thysanoptera, Phlaeothripidae). Proc. Ent. Soc. Wash 49(9): 250-251.

Hood, J. D.

1912. Descriptions of new North American Thysanoptera. Proc. Ent. Soc. Wash. 14(3):129-160, 5 pls.

1938. Seven new Phlaeothripidae from the United States. Bull. Brooklyn) Ent. Soc. 33(5):205-218.

1939. New North American Thysanoptera, principally from Texas. Rev. de Ent. 10(3):550-619.

Jacot-Guillarmod, C.

1939. Phlaeothripidae (Thysanoptera) new to South Africa, with descriptions of new genera and species. Jour. Ent. Soc. So. Africa 2:36-62.

Priesner, H.

1925. Thysanopterologica I. Zool. Jahr., Abt. für Syst., Geog. und Biol. der Tiere 50:305-319.

Stannard, L. J., Jr.

1957. The phylogeny and classification of the North American genera of the suborder Tubulifera (Thysanoptera). Ill. Biol. Monographs No. 25:1-200.

Vol. 71, pp. 149-152 Nov. 10, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW COLEONYX FROM TEXAS

By William B. Davis
and James R. Dixon

Department of Wildlife Management, Texas A. and M. College, College Station, Texas

During the course of an ecological survey of the Big Bend Region of Texas, supported by the Texas Game and Fish Commission under contract with the Texas Agricultural Experiment Station, a single specimen of a large ground gecko was captured June 20, 1956, in a snap trap set for rodents. Site of capture was in a broken lava flow about half way up the ridge directly north of the headquarters of the Black Gap Wildlife Management Area about 50 miles south-southeast of Marathon. The general area is typical of the Chihuahuan Desert with such plants as chino grass, cactus, legchugilla, sotol, leucophyllum and other desert shrubs dominating the landscape.

This large gecko is most closely allied to the forest-dwelling geckos of the *Coleonyx elegans-C. mitratus* group of southern Mexico and Central America and its occurrence in the desert habitat of the Big Bend was most unexpected. We have thought of the possibility that the specimen may have been transported to the Black Gap by man, but this seems unlikely because of the remoteness of the area from thhe usual travelways of man. Special efforts have been made to find additional specimens since 1956 but we have turned up only *Coleonyx brevis* which is common in the area.

The closest known occurrence of the related *Coleonyx elegans* is in Colima on the west coast of Mexico and in Veracruz on the east coast (see Klauber, 1945, Trans. San Diego Soc. Nat. Hist., 10(11):133-216). Both of these areas are several hundred miles from the Big Bend section of Texas.

The most conspicuous characters of the Texas specimen are (1) its large size, (2) the enlarged tubercles on the dorsum and (3) the reticulated dorsal pattern. The first two place it in the *elegans-mitratus* group, but since it lacks the bold dorsal bands and differs in several other respects we believe it represents a new species. Dr. Hobart M. Smith, who has examined the specimen and compared it with other species of *Coleonyx*, supports our view. For this new species we propose the name

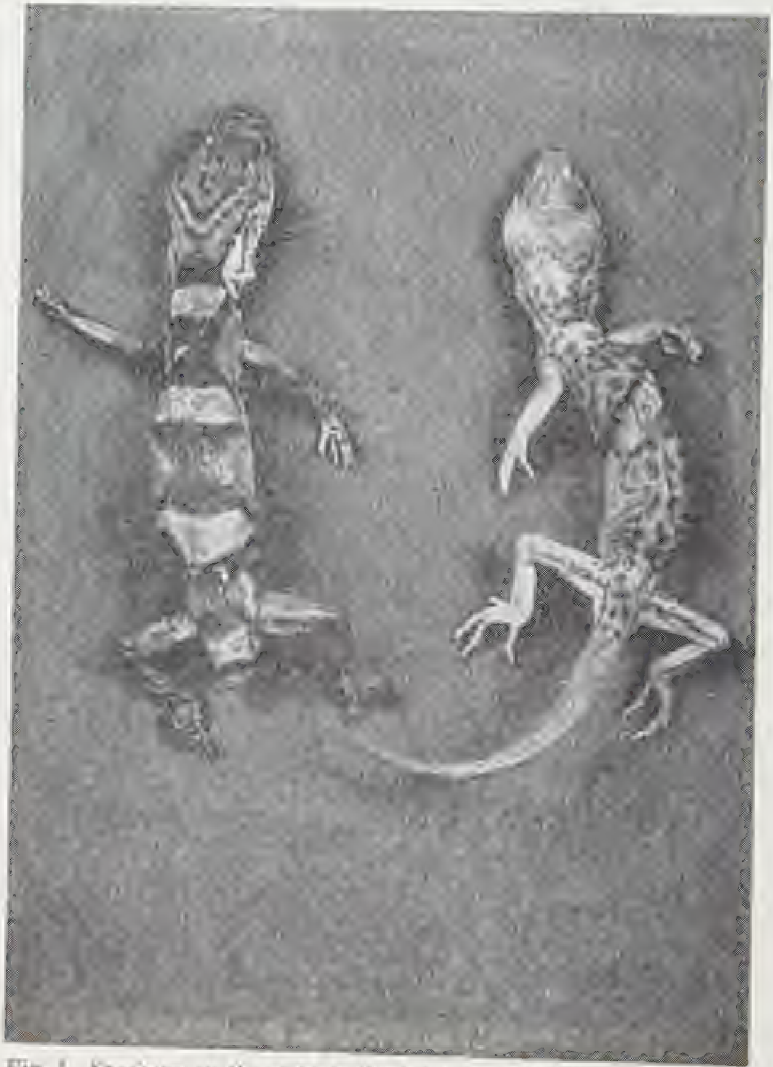


Fig. 1. Specimen on the right is the holotype of *Coleonyx reticulatus*; the one on the left is *Coleonyx elegans*. Note differences in color pattern, shape of head, and distinctness of dorsal tubercles. Diagonal black mark on animal at right is a wound caused by the snap trap in which it was caught.

Coleonyx reticulatus *sp. nov.*

Holotype: Adult female, No. 12855, Texas Cooperative Wildlife Collection, from Black Gap, 50 miles south-southeast of Marathon, 2500 ft. elevation, Brewster County, Texas; collected by Charles K. Winkler, June 20, 1956; original No. 6.

Diagnosis: A large *Coleonyx* with 13 irregular rows of tubercles on dorsum; 24 and 31 lamellae on fourth finger and fourth toe, respectively; tips of claws exposed by the sheath-scales; dorsum with profusion of small dark spots and reticulations; snout-vent length about 80 mm.

Description of Holotype: Adult female; snout-vent length, 82 mm.; length of tail (partly regenerated), 58 mm.; length of head, 20 mm.; width of head, 15 mm.; snout to eye, 7 mm.; snout to ear, 17 mm.; width of eye, 6 mm.; internarial width, 3 mm; length of leg, 35 mm.; length of arm, 26 mm.; dorsal part of head covered with non-imbricate, circular granules; rostral wider than high, apex rounded and extending posteriorly to anterior edge of nostril; prenasals, 1-1; internasals, 1-1; postnasals, 2-2; subnasals, 2-2; supranasals, 1-1; supralabials 9-9; first supralabial twice the size of others in series; infralabials 12-12, last three very small, hidden by fold of skin when mouth is closed; nostrils large, subcircular; two rows of scales bordering eye lids, outer row flesh color, inner row black; ear large, 4 times longer vertically than wide; mental somewhat oval and irregularly rounded posteriorly, bordered posteriorly by 9 chin scales; mental and first infralabial on each side contacted by 13 granules.

Dorsum covered by granules similar in size to those on head, interspersed with 13 irregular rows of enlarged tubercles that become larger posteriorly; about 26 tubercles between limb insertions along mid-dorsal line; enlarged dorsal tubercles keeled or peaked, somewhat flattened laterally; venteral scales inbricate, 3 to 4 times larger than dorsal granules, about 31 scales across venter; approximately 90 scales from anterior arm insertion to enlarged preanal scales; preanal pores not in evidence but indicated by slight depressions in center of each enlarged preanal scale, the latter total 17.

Arms and legs without enlarged tubercles, size of granules equal to those on dorsum; 4th finger and 4th toe longest; lamellae on 4th finger and 4th toe 24 and 31, respectively; tail regenerated, without enlarged tubercles, but covered by rows of imbricate scales, largest ventrally; two postanal sacs present; cloacal bones not evident externally.

Head light brown above, spotted profusely with brown; no evidence of light nuchal loop; inner surface of eyelid black, outer edge flesh colored; chin, flesh colored; throat, yellowish-white; labials densely spotted with brown; dorsum and tail light brown with large brown spots and reticulations; venter flesh color.

Comparisons: Most closely allied to *C. elegans* (Gray) and *Coleonyx mitratus* (Peters) in having large tubercles intermixed with the granular scales on the dorsum. In *C. variegatus* (Baird), *C. fasciatus* (Boulenger) and *C. brevis* Stejneger the dorsal scales are uniformly granular. Similar to *elegans* in having scales of the claw sheath long with only the tips of the claws exposed. It differs from *elegans*, however, in having (1) a reticulated dorsal pattern (rather than bold bands), (2) dorsal tubercles in about 13 irregular rows (rather than 19 to 21), (3) tubercles about half as large in basal area, (4) 24 and 31 lamellae on fourth finger and fourth toe, respectively, rather than 17 and 20 or less, etc.

Differs from *mitratus* in (1) sheath of claw long so that only the tip of the claw is exposed; (2) dorsum reticulated rather than with cross bars; (3) dorsal tubercles in 13 rows rather than 21 to 23, etc.

Vol. 71, pp. 153-154 Nov. 10, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW AMPELOCERA FROM CUBA

C. V. Morton

The genus *Ampelocera* is distinguished from other Cuban trees of the family Ulmaceae by its pinnately veined leaves, numerous stamens, and small, drupaceous fruits. Two species have been known from Cuba, both exceedingly rare:

AMPELOCERA CUBENSIS Grisebach, Cat. Pl. Cub. 57. 1866. Type from Pinar de Rio, *Charles Wright* 2222. Another collection is Sierra de Anafe, Pinar del Rio, *Wilson & Leon* 11398.

AMPELOCERA CRENULATA Urban, Repert. Sp. Nov. Fedde **15**: 399. 1919. Type from western Cuba, *Ramon de la Sagra* 413. Known only from the type.

These species may be distinguished from the new species described below as follows:

Leaf-blades crenulate throughout; sepal glabrous ....A. crenulata
Leaf-blades entire: sepals densely sericeous-pilose externally.
  Leaf-blades densely soft-pilosulous all over the lower surface; stipules 4.5-6 mm. long ....A. pubescens
  Leaf-blades glabrous or bearing a few minute hairs along the midrib and primary veins; stipules 3 mm. long ....A. cubensis

Ampelocera pubescens Morton, sp. nov.

Arbor 6-10.5. alta, trunco usque ad 30 cm. diam.; ramuli graciles, ca. 2 mm. diam, grisei vel albiduli, inermes, perspicue lenticellati, juventute dense puberuli; folia simplicia, alterna, decidua; petioli nigricantes, 5-6 mm. longi, dense breviter pubescentes, supra paullo canaliculati, subtus teretes; lamina foliorum ovata ad oblonga, 7.5-15 cm. longa, 4-8.5 cm. lata, apice acuminata, basi subaequaliter cordata, integra, chartacea, supra viridis, nitens, glabra, venis lateralibus minute pubescentibus exceptis, subtus pallidior, ubique molliter pilosula, venis primariis pinnatis, 6-8-jugis, secundariis supra prominente reticulatis; stipuli laterali, lanceolati, 4.5-6 mm. longi, 1.7 mm. lati, acuminati, crassi, externe pubescentes, mox decidui; flores hermaphroditi, sessiles, in glomerulis 2 vel 3, axillaribus, sessilibus in ramulis non foliatis positi, bracteis nonnullis, minutis, orbicularibus, brunnescentibus, coriaceis suffulti; petala desunt; sepala 4 vel 5, imbricata, ovata, ca. 2 mm. longa et 1.5 mm. lata, concava, apice rotundata, integra, externe dense sericeo-pilosa, intus parce pilosula; stamina 16, filamentis gracilibus, ca. 2 mm. longis, glabris, antheris ca. 1.2 mm. longis, oblongis, loculis longitudinaliter dehiscentibus, connectivo apiculato, loculos superante; ovarium dense puberulum, 1-loculare, ovulo singulo, ex apice pendulo; **stylus** puberulus, crassus, ca. 2 mm. longus; stigmata 2, conspicua, divergentia, ca. 3 mm. longa, teretia, apice subulata, puberula; drupa globosa, 6 mm. longa, 7 mm. lata, dense pubescens, apice basi styli coronata, basi calycis lobis persistentibus suffulta, eis non accrescentibus; endocarpium laeve, parietibus vix scleroticis, ca. 0.25 mm. crassis; semina exalbuminosa, cotyledonibus foliaceis, latissimis, perspicue contortis, radicula superiore,

Type in the U. S. National Herbarium, no. 1,477,418, collected at Limones, Soledad, Province of Las Villas, Cuba, April 26, 1928, by J. G. Jack (no. 6036); a specimen with leaves and fruits. The description of the flowers is drawn from a paratype collected at the same locality, March 12, 1927, by J. G. Jack (no. 4911, U. S. Nat. Herb. no. 1,476,593). Additional collections, all from the same locality and sterile, are *Jack* 5396, 5634, and 7490. According to the notes by Dr. Jack, this is a small tree growing on rocky ridges in woods. The bark is gray and slightly rough. The fruit is yellowish.

Smithsonian Institution, Washington, D. C.

Vol. 71, pp. 155-156 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF ESSIGELLA FROM OREGON (APHIDAE)

By F. C. Hottes

I am indebted to the District Forest Ranger of the Mt. Hood National Forest for sending me the new species of *Essigella* described herewith.

Essigella oregonensis n. sp.

Apterous viviparous female.

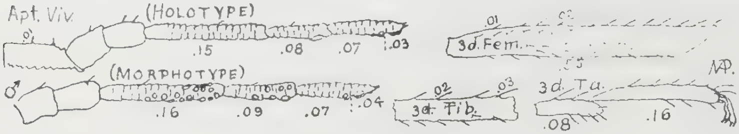
Length from vertex to end of cauda varying from 1.57-1.65mm. Color in life not recorded, most likely with body pale green, as mounted free from pigmented spots on abdomen. First antennal segment slightly darker than second, third segment pale on basal half, remainder of segment and all of fourth and fifth segments pale dusky. Femora pale dusky with anterior margins slightly darker. Tibiae dusky, quite uniform throughout. Tarsal segments dusky.

Head and thorax:—Anterior margin of head with a few very short, .01mm. long, stubby hairs which are limited to the anterior region of the head. Ventral portion of head with a few long sharp pointed hairs. Antennal segments one and two with a few short fine sharp pointed hairs. Hairs on remaining antennal segments extremely few, short, they being little if any longer than the width of the imbrications, which extend almost to the base of the third antennal segment. Length of antennal segments as follows: III .15mm., IV .08mm., V .07 + .03mm. There are no secondary sensoria, and the primary sensorium is lacking on the third antennal segment. Rostrum extending to the metathoracic coxae. Lengths of pro and metathoracic femora .405 and .55-.57mm. Lengths of pro and metathoracic tibiae .405-.45 and .82mm. Hairs on anterior margin of prothoracic femora very short. Hairs on anterior margin of metathoracic femora varying from .01-.02mm. The hairs on this margin are rather thick and blunt at the end, remaining hairs on this segment finer and sharper at the end, but only slightly longer. Hairs on outer margin of metathoracic tibiae sparse, spaced farther apart than their length, varying from .02-.03mm. in length with the longer hairs near the apex. All hairs on the outer margin of this segment coarse and blunt at the apex. Hairs on inner margin of metathoracic tibiae shorter, finer and sharp pointed. Dorsum of first metatarsal segment with two long hairs, dorsum of other segments similar. Ventral surface of first metatarsal segment with about five hairs. Dorsum of metatarsal segment with hairs longer and coarser than the hairs on the ventral surface.

Abdomen.—Cornicles with base surrounded by dusky. Anal plate with short and long hairs intermixed on outer margin. Cauda with few long hairs, median posterior tubercle poorly developed. Hair on dorsum of abdomen extremely sparse, short and blunt at the tip, hairs on the ventral surface of abdomen longer, more numerous and sharp pointed.

Apterous male.

Length 1.08mm. Color notes from living specimens not available, mounted specimen similar in color to apterous viviparous female. Length of antennal segments as follows: III .16mm., IV .09mm., V .07 + .04mm. Secondary sensoria distributed as follows: III 19 on apical two thirds of segment IV 7-9. Primary sensorium of fifth segment large, marginal sensoria few. Hairs on vertex of head similar to hairs on apterous viviparous female. Rostrum with last two segments extending beyond metathoracic coxae. Lengths of prothoracic femora and tibiae .315 and .345mm. Lengths of metathoracic femora and tibiae .42 and .615mm. Lengths of metathoracic tarsal segments .075 and .135mm. Median tubercle on cauda absent.



Essigella oregonensis n.sp.

In my key to the species of *Essigella* in Bio. Soc. Of Washington Vol. 70, 1957 this species keys to couplet 17. It is larger than *E. pergandei* and smaller than *E. Claremontiana.* It not only differs from *pergandei* in size but has the hairs on the anterior margin of the metathoracic femora blunt, median tubercle on cauda not so well developed, hairs on inner margin of metathoracic tibiae not longer than those on the outer margin, and hairs on dorsal surface of metathoracic tarsal segment II much longer than those on the ventral surface.

Host, *Pinus albicaulis* (whitebark pine). Government Camp, Oregon Aug. 17, 1958. Collected near Timberline Lodge on Mt. Hood, by District Forest Ranger. Holotype apterous viviparous female allotype apterous male mounted on same slide as holotype. Holotype slide deposited in the United States National Museum.

Vol. 71, pp. 157-160 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF *CINARA* FROM CALIFORNIA SUGAR PINE (APHIDAE)

F. C. Hottes

The description of this species adds another *Cinara* to the list of species inhabiting our western pines.

Cinara saccharinipini n. sp.

Apterous viviparous female.

Size and general color.—Length from vertex to end of cauda varying from 3.37-3.90mm. All specimens have been over cleared, and no color notes from life were recorded. Color as represented from mounted specimens as follows: Head and thorax pale dusky, antennal segments III, IV and V pale with apical regions of segments dusky, most of VI dusky. Prothothoracic femora pale at the base with the remainder pale yellowish. Prothoracic tibiae dark dusky at the base, this followed by dusky which increases to dark dusky at the apex. Metathoracic femora not as dark as the prothoracic femora and the pale region longer. Metathoracic tibiae much darker than the prothoracic tibiae, with the dark dusky area much longer. Tarsal segments dark dusky. Cornicles pale dusky, as cleared but little darker than abdomen. Cauda and anal plate dusky. Transverse pigmented spots pale.

Head and thorax.—Antennal segments with the following lengths: III .46-.48mm., IV .18-.20mm., V .26mm., VI .12 + .03mm. Sensoria distributed as follows: III 0-1 as a rule none, IV with only primary, V one secondary, plus primary. Primary sensorium on VI small, marginal sensoria few.

Hair on anterior margin of antennal segments more numerous and longer than on posterior margin. Hairs on anterior margin of third antennal segment not all of the same length, the longest which are the most numerous are about .09mm. in length, the shortest are about .03mm. long. All are set at an angle of about sixty degrees or more. The first and second antennal segments have numerous hairs. None of the antennal segments show imbrications. Rostrum extending to transverse pigmented spots. Last three segments of the rostrum with the following lengths: .215mm., .215mm, and .06mm. Eyes small, ocular tubercles well developed. Median transverse suture of head narrow, not much darker than rest of head. Hairs on vertex and dorsum of head fairly numerous, varying in length from .12-.15mm. not present on posterior margin. Mesosternal tubercle short, wide, rather rounded. Lengths of pro and metathoracic femora varying as follows: .93-1.05mm., 1.44-

1.50mm. Lengths of pro and metathoracic tibiae varying as follows: 1.35-1.50mm., 2.50-2.55mm. Hairs on femora numerous. Hairs on metathoracic tibiae numerous, set at an angle of about forty-five degrees fine. Hairs in mid region varying from .08-.10mm. in length, of about the same length and texture on both outer and inner margins, but noticeably more numerous on inner margin near apex. First metatarsal segment with about 15-17 hairs on the ventral surface, this segment is about .14mm. in length. The second metatarsal segment is about .27mm. in length, on this segment the hairs on the ventral surface are more numerous than the hairs on the dorsal, the hairs on the two surfaces are of about the same length.

Abdomen.—Cornicles about .45mm. in width, with outer margin irregular, but not greatly so. Hairs on cornicles evenly distributed except for the rim where they are more numerous, finer and shorter than elsewhere, the longest about .10mm. in length. The hairs on the dorsum of the abdomen are numerous, about .12mm in length and rather coarse. The hairs on the ventral surface of the abdomen are more numerous than those on the dorsum, and slightly shorter and finer. The transverse pigmented spots are narrow and rather long, they have two irregular rows of long coarse hairs distributed rather evenly over the surface. The genital plate is small, rather narrow, and concave on the posterior surface, about eight hairs are located near the ends. Hairs on cauda confined largely to posterior margin. Median posterior portion of cauda bluntly pointed.

Alate viviparous female.

Length from vertex to end of cauda varying from 3.45-3.60mm. Color in life not recorded, cleared specimens similar to color of apterous viviparous female.

Head and thorax.—Antennal segments with the following lengths: III .48mm., IV .18-.20mm., V .22-.25mm., VI .12 + .03mm. Secondary sensoria distributed as follows: III 4-6 as a rule five or more, IV 1-2 as a rule only one, V 0-2 as a rule one. On the third segment the sensoria are quite large covering more than half of side, arranged in a straight row, confined to apical half of segment, slightly tuberculate. Hair on antennal segments quite similar to hair on antennae of apterous viviparous female, except that there are no short hairs on the third segment, all hairs varying only slightly from .08mm. in length. No antennal segment imbricated. First and second antennal segments with numerous hairs. Hairs on dorsum of head fairly numerous, about .09mm. in length, posterior margin of head free from hairs. Lateral lobes of thorax with numerous hairs except for more lateral regions where the hairs are few or wanting. Median posterior lobe of thorax with numerous hairs. Costal margin of fore wing dark. Radial sector straight, radial cell long and narrow. Media once branched, the branch far removed from margin of wing. Surface of wings covered with long black scale-like structures.

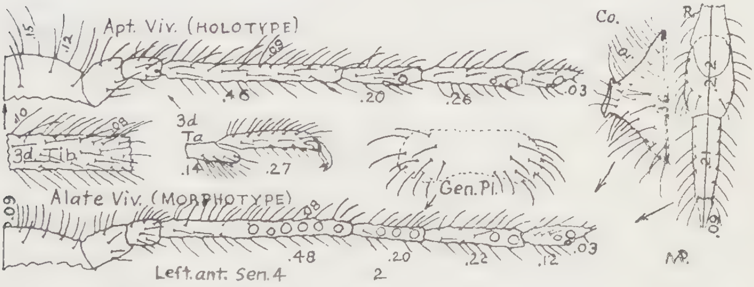
Rostrum almost reaching mid region of anal plate. Lengths of pro and metathoracic femora 1.05 and 1.65mm. Lengths of pro and metathoracic tibiae 1.44 and 2.77mm. Metathoracic tarsal segments .14 and .27-.28mm.

Abdomen.—Cornicles slightly smaller than cornicles of apterous viviparous females, varying from .30-.36mm. Hairs on cornicles and hairs on dorsal and ventral surfaces similar to hairs on these surfaces of the apterous viviparous female. Genital plate small, narrow, concave on the ventral surface, with eight hairs near the ends.

This species differs from *C. moketa* H. by having a median mesosternal tubercle, longer fourth antennal segment, longer femora and tibiae. From *C. hirticula* H. this species differs by having shorter antennal segments, longer segments of the rostrum, longer hairs on the tibiae and less extensive cornicles, the mesosternal tubercle is also shorter.

Holotype, apterous viviparous female, morphotype alate viviparous female, both mounted on the same slide which has been returned to the collection of Prof. E. O. Essig. Host, *Pinus lambertiana* (sugar pine) Upper Lake, California. Dec. 12, 1956 Coll. R. E. Ryckman.

In Palmer's key to the genus *Cinara* in, Aphids Of The Rocky Mountain Region, this species keys to couplet number 22. This couplet deals with the length of rostral segment four. None of the alternatives fit this species, but the one to *C. pseudoschwarzii* comes more nearly doing so. This species differs from *pseudoschwarzii* by having more hairs on the antennal segments, shorter hairs on the tibiae, less upstanding hairs on the tibiae, longer first metatarsal segment, and the legs and cornicles not black.



Cinara saccharinipini n. sp.

Vol. 71, pp. 161-162 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW BIRDS FROM EASTERN ASIA

By H. G. Deignan*

I.

Peters (Check-list of Birds of the World, vol. 4, 1940, p. 252) records the Malayan house swift, *Apus affinis subfurcatus*, as "casual in the Philippines, Formosa and the Borodino Islands." Hachisuka (Quarterly Journal of the Taiwan Museum, vol. 4, Nos. 1 & 2, June 1951, p. 76) emendates Peters's statement, saying "A small number of this House-Swift [*subfurcatus*] is resident in Formosa, breeding probably in high mountains and descending to the low plains in winter."

I have recently obtained from Dr. Robert E. Kuntz, Head of the Parasitology Department, U. S. Naval Medical Research Unit No. 2, based in Formosa, a series of 29 adult house swifts (many of them captured on their nests) from the suburbs of Taipei. They prove to represent on undescribed subspecies, which may be called

Apus affinis kuntzi, subsp. nov.

Type: U. S. National Museum No. 469354, unsexed adult, collected at Shih Lin (a northern suburb of Taipei), Taipei Hsien, Formosa, on 26 June 1958, by C. Cheng; original number PF 5007 d.

Diagnosis: Nearest *Apus affinis subfurcatus* (Blyth) of Malaya, but easily separable by having the general coloration an almost matt black, and so far as it is glossed at all, glossed with greenish blue rather than steel blue; the throat patch and rump band ashy white, not snow white, and thus less sharply defined from the adjacent dark areas of the plumage.

Range: Northern Formosa. (Reports of the occurrence of *A. a. subfurcatus* in the Borodino Islands, the northern Philippines, and on the coast of Fukien should be reconsidered.)

II.

In course of study of the Timaliinae for a forthcoming volume of Peters's Check-list of Birds of the World, I find it necessary to name a hitherto unreported population of the blue-winged siva from the lowlands of Szechwan. I shall call it

---

*Published with permission of the Secretary of the Smithsonian Institution.

Minla cyanouroptera croizati, subsp. nov.

Type: U. S. National Museum No. 310764, adult male, collected at Ipin [Suiful], Szechwan, on 2 April 1928, by David C. Graham.

Diagnosis: Nearest *Minla cyanouroptera wingatei* of Yunnan, but differing by having the ground color of the crown and nape a darker, more slaty (less vinaceous), violet-gray; the mantle and upper tail coverts a deeper, richer, less fulvous, brown; the under parts (especially anteriorly) a deep vinaceous gray, rather than vinaceous-washed white.

Range: Known by 15 specimens from the type locality, taken at elevations between 1,000 and 3,000 feet.

Remarks: This race is named in honor of my friend Léon Croizat of Caracas, Venezuela.

Vol. 71, pp. 163-166 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

REVIEW OF MEXICAN BATS OF THE ARTIBEUS "CINEREUS" COMPLEX

By William B. Davis
Department of Wildlife Management Texas A. and M. College, College Station, Texas

In attempting to unravel the identity of three small forms of *Artibeus* we have from Guerrero, I have had occasion to review the treatment of the Mexican forms of the small members of that genus. Andersen (Proc. Zool. Soc. London, 1908: 204-319) revised the genus and recognized five species as occurring in Mexico as follows; *Artibeus toltecus toltecus* (Saussure) to which he referred specimens from Durango, Jalisco, Tepic (= Nayarit), Oaxaca, and Veracruz; *Artibeus phaeotis* (Miller) in Yucatan; *Artibeus aztecus* Andersen from Tetela del Volcan, Morelos; *Artibeus nanus* Andersen from Sinoloa, Colima Guerrero, and Veracruz; *Artibeus turpis* Andersen from Tabasco.

Hershkovitz (Proc. U. S. Nat. Mus., 1949, 99(3246):429-454) considers *toltecus* and *phaeotis* to be conspecific with the South American form *Artibeus cinereus* (Gervais) but recognizable as distinct subspecies. Later, Dalquest (Proc. Biol. Soc. Washington, 1953, 63:61-66), the last reviewer of the Mexican forms, reduced the number of species of small Mexican *Artibeus* to three (*A. cinereus, A. turpis,* and *A. nanus*) by placing *aztecus* as a subspecies of *A. cinereus.*

Because the treatments by both Hershkovitz and Dalquest seemed at variance with the specimens we have accumulated from Mexico, I have attempted to reevaluate the relationships of the five "species" recognized by Andersen. I am indebted to officials of the U. S. National Museum, the Chicago Natural History Museum, the University of Kansas Museum of Natural History, and the Louisiana State Museum of Zoology for the loan of comparative material.

Although *Artibeus nanus* and *A. turpis* resemble *A. cinereus* in having a relatively wide, nearly naked interfemoral membrane, they both differ from that species in having a depressed rostrum, a highly arched cranium and a relatively short palate. *A. turpis* differs from *nanus* mainly in slightly larger size. In fact, the two appear to be geographic races of the same species, with *turpis* occupying the lowlands of eastern and southern Mexico (*Veracruz:* Plan del Río, 2, TCWC; Arroyo Azul 1, 1, UKMNH. *Tabasco:* 2 mi. Teapa, 5, UKMNH. *Oaxaca:* 2 mi. S.

Tollocito (= Tolloso), 1, UKMNH) and *nanus* occupying the lowlands of western Mexico (*Guerrero:* Tierra Colorado (type locality); Tres Palos, 1, TCWC; El Papayo, 1, TCWC. *Colima:* Hacienda Magdalena, 7, USNM. *Sinaloa:* Presidio, 1, BMNH). Adult specimens from Petén, Guatemala, are larger than *nanus* from Guerrero (forearm 37.5-39 mm. rather than 35.0-36.5 mm.) and appear to be referable to *turpis.* Two specimens (UKMNH 64923-24) from Astillero, Guatemala, are young individuals with forearms 35 mm. and 36.5 mm., respectively. On geographic probability they, too, should be assigned to *turpis.*

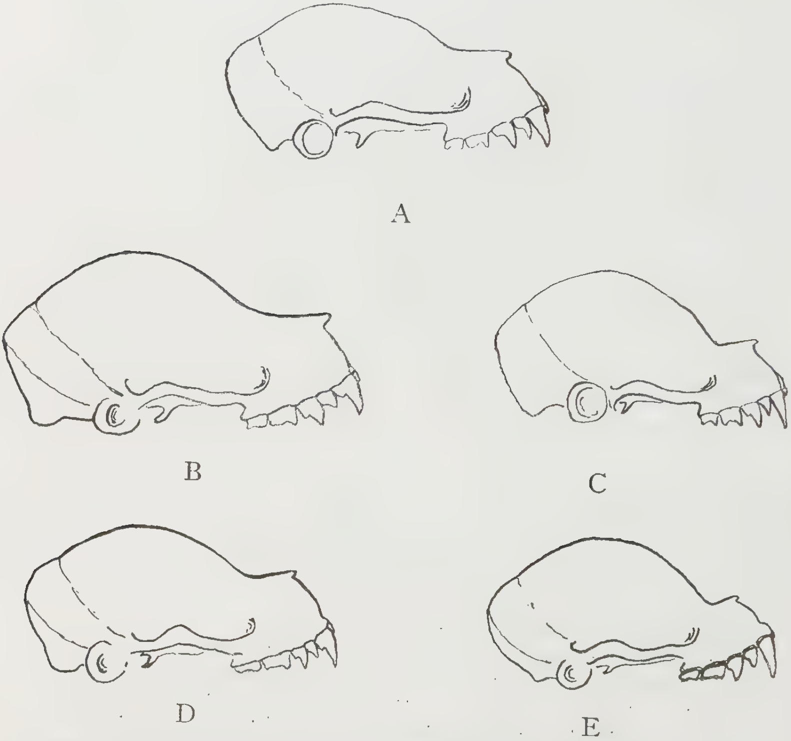


Fig. 1. Cranial profiles of five forms of Mexican *Artibeus* X2.
A. *Artibeus cinereus phaeotis;* B. *Artibeus aztecus;*
C. *Artibeus toltecus;* D. *Artibeus turpis turpis;*
E. *Artibeus turpis nanus.* Note particularly the overall size and especially the profile of the rostrum and frontal region.

The relegation of *Artibeus phaeotis* as a subspecies of *A. cinereus* seems fully justified. Both have a rather wide interfemoral membrane (8-10 mm.) which is naked or nearly so, the whitish supraorbital stripes are usually conspicuous, the slope of the frontal region of the skull is similar, and the length of the forearm is comparable. This form occurs in the lowlands of eastern Mexico in *Veracruz* (Jesus Caranza, Minatitlán, Río Solosuchil and possibly Achotal), *Yucatan* (Chichen Itza), and *Campeche* (La Tuxpena).

I cannot concur with Hershkovitz (*op. cit.*) and Dalquest (*op. cit.*), however, in aligning *Artibeus toltecus* with *A. cinereus* or with Dalquest's (*op cit.*) placing of *A. aztecus* as a subspecies of *A. cinereus*. That *toltecus* and *aztecus* are closely related is not questioned, but they both differ from all forms of *cinereus* I have examined (*cinereus, rosenbergi,* and *phaetois*) in (1) interfemoral membrane narrow (6.5 mm. or less), deeply incised, and conspicuously hairy; (2) ears with no trace of white on the rim; (3) whitish supraorbital stripes present but rather inconspicuous; and (4) slope of the frontal region gently rising (fig. 1 b-c). These differences are sufficient, at least to me, to preclude treating them as geographic races of *A. cinereus*.

On the basis of material at hand I consider *aztecus* and *toltecus* not only specifically distinct from *cinereus*, but also from each other. The differences between *aztecus* and *toltecus* are of the magnitude that separate two larger species of Mexican *Artibeus,* namely *lituratus* and *jamaicensis. A. aztecus* is larger than *A. toltecus* in all measurements. The specimens from El Salto (*ca.* 2000 ft.), San Luis Potosí, which Dalquest (*op. cit.*) considered as intergrades between *aztecus* and *toltecus* are not, in my opinion, intergrades but rather are clearly referable to *toltecus*. Perhaps he was led to his conclusion because the skull of one of the specimens of *aztecus* (LSUMZ 2790), from Cerro Campanario, San Luis Potosí, approaches *toltecus* in size and is noticeably smaller than the other known specimens of *aztecus*.

All four known locality records of *aztecus* (*Morelos:* Tetela del Volcan, 6550 ft., 4, BSC. *Guerrero:* Omiltemi, 7900 ft., 4, TCWC. *Jalisco:* 2 mi. N Ciudad Guzman, *ca.* 5000 ft., 4, KUMNH. *San Luis Potosí:* Cerro Companario, 7900 ft., 4, LSUMZ) indicate that this species inhabits mountainous areas at elevations above 5000 feet. Consequently, if *aztecus* intergrades with *toltecus* of the lowlands, such intergrades would most likely be found at middle altitudes. Specimens from near Taxco (4,000 ft.) and Agua del Obispo (3300 ft.) in Guerrero, however, are clearly referable to *toltecus*. Yet *aztecus* has been taken at Omiltemi (7900 ft.) less than 30 airline miles from the latter locality.

Known locality records for *toltecus* in Mexico are at elevations below 5000 feet. Thus, the two forms appear to complement each other geographically, but, until demonstrable intergradion is established, it seems wisest to adopt a conservative view and consider the two as distinct species.

In summary, the five small forms of *Artibeus* in Mexico seem to segregate as follows:

a. Interfemoral membrane narrow (greatest width 6.5 mm. or less), deeply incised, and conspicuously hairy; ears with no trace of white on rim; whitish supraorbital stripes present but inconspicuous; frontal region of skull gently rising (see fig. 1 b-c).
    b. Forearm 43-47 mm.; 3rd metacarpal 41.3-45.3; greatest length of skull 21.5-23; length of maxillary tooth row (C-M^2), 7.0-7.6 .... *Artibeus aztecus*
    bb. Forearm 38-42 mm.; 3rd metacarpal 37-40; greatest length of

skull 20.4-21.2; length of maxillary tooth row (C-M^2), 6.6-6.9 .... *Artibeus toltecus*

aa. Interfemoral membrane wider (greatest width 8-10 mm.), less deeply incised, and almost naked; whitish supraorbital stripes usually conspicuous.

c. Rostral area of skull short, depressed posteriorly and upturned anteriorly; palatal length to posterior border of incisive foramina less than post-palatal length; ears white-edged.

d. Forearm, 37.6-40; length of skull, 19-20; length of upper tooth row (C-M^2), 5.9-6.7. *Artibeus turpis turpis.*

dd. Forearm, 35.2-38; length of skull, 18.0-18.7; length of upper tooth row (C-M^2), 5.6-6.1. *Artibeus turpis nanus.*

cc. Rostral area of skull not depressed posteriorly; frontal region gently sloping, not highly arched; palatal length to posterior border of incisive foramina greater than post-palatal length; ears concolor, not white-edged. *Artibeus cinereus phaeotis.*

Vol. 71, pp. 167-170 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE STATUS OF THE BAT *MYOTIS VELIFER COBANENSIS* GOODWIN

By Luis de la Torre*

Department of Zoology, and Museum of Natural History, University of Illinois, Urbana, Illinois.

Myotis velifer cobanensis Goodwin (Amer. Mus. Nov. No. 1744: 2, 1955) was described from an individual taken in Cobán, Guatemala, and was characterized by small size, dark color, second lower premolar crowded between the first and third premolars, overlapping lower incisors, and distinct cranial characters.

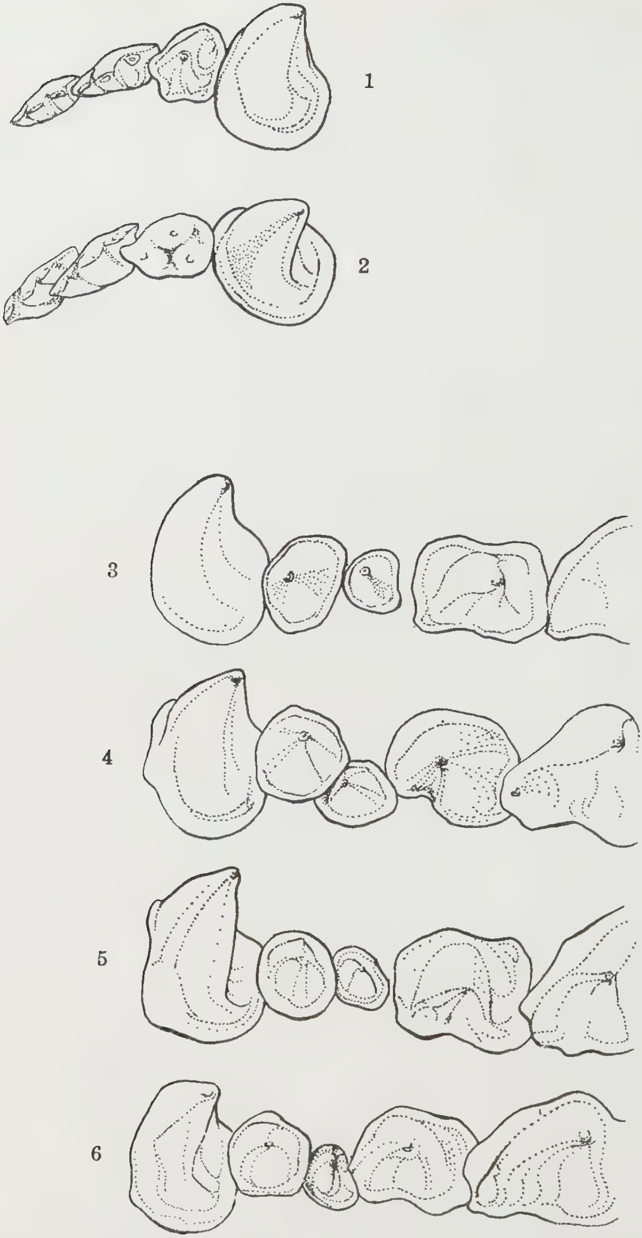
The questions that immediately arise are the following: Are the previously recorded specimens from Guatemala *Myotis velifer velifer* J. A. Allen, 1890, or *Myotis velifer cobanensis* Goodwin, 1955? If both subspecies occur in Guatemala what is their distribution, and what is the evidence that they are subspecies? Is the single individual a small specimen of *M. v. velifer?*

The study of the available material of *M. velifer* from Southern México and Guatemala, including the type and topotypes of *M. v. velifer*, clearly indicates that *Myotis velifer velifer* occurs in Guatemala. The probable distribution of this bat throughout the southern highlands of México and in Guatemala is outlined in Figure 7. The Guatemalan records indicated represent the southernmost known limits of the range of *M. velifer*. I find the specimens from Panajachél, Chocoyos, and Santa Clara, in Guatemala, indistinguishable in size and color from specimens of *M. v. velifer* from La Palma, Tancítaro, and Pátzcuaro in Michoacán, México. In forearm size, for example, 64 specimens from Chocoyos, Guatemala, average 45.0 mm with a range from 42.0 mm to 47.1 mm, while a series of 60 specimens from La Palma, Michoacán, México, averages 44.3 mm and ranges from 42.1 mm to 47.1 mm. Forearm measurements of the Santa Clara specimens are 44.2 mm, 44.5 mm, and 45.4 mm. In skull size no significant difference is seen between the Mexican and the Guatemalan specimens. Six skulls from western Guatemala average 16.5 mm in greatest length, ranging from 16.3 to 16.9 mm. The single skull available (cleaned) from Santa Clara measures 17.0 mm.

The Guatemalan specimens agree with the Mexican *M. v. velifer* in color and size rather than with *M. v. cobanensis* (forearm 41.1 mm, greatest length of skull, 15.4 mm). It is of interest that even the three

---

*This work was begun during my tenure of the Thomas J. Dee Fellowship awarded by the Chicago Natural History Museum.



Figures 1-6. Individual variation in position of right lower incisors and right second lower premolar in specimens of *Myotis velifer velifer* from Michoacán, México (Figs. 1-4), and from Chocoyos, Guatemala (Figs, 5, 6). Drawings by E. John Pfiffner, approximately X 10.

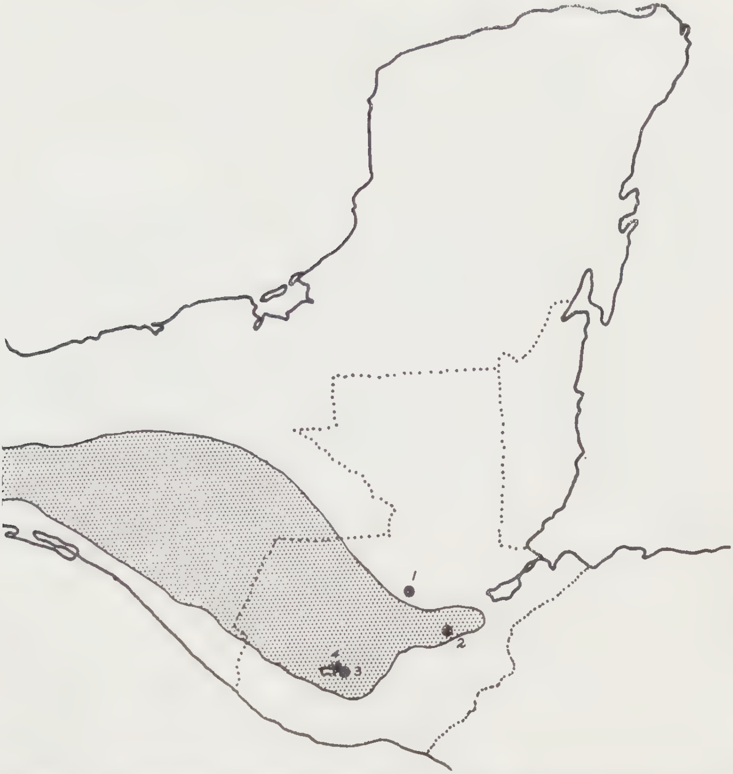


Figure 7. Guatemalan locality records of *Myotis velifer velifer,* and the type locality of *Myotis velifer cobanensis.* 1. Cobán, Alta Verapáz (type locality of *M. v. cobanensis*). 2. Santa Clara, Zacapa. 3. Chocoyos, Chimaltenango. 4. Panajachél, Sololá.

specimens from Santa Clara, a locality but 50 miles southeast of Cobán (see Fig. 7), show no approach nor gradation toward the characters of *cobanensis.* In fact, one skin from this locality is the lightest of the Guatemalan series. Thus, in the absence of a gradation in morphology, one can only doubt that a genetic connection exists.

The type specimen of *cobanensis* was later examined and compared with adult and immature individuals of *M. v. velifer.* My measurements of the type, in millimeters, are as follows: Forearm, including carpals, 41.1; metacarpal III, including carpals, 39.3; foot, 9.9 tibia, 15.6; greatest length of skull, 15.4; condylobasal length of skull, 14.1; mastoid breadth, 7.8; palatilar length, 6.5; postorbital constriction, 3.8; braincase breadth, 7.2; greatest breadth across molars, including molars, 6.3; maxillary tooth row, 6.2; mandibular tooth row, 6.6; greatest length of mandible, 11.4.

The dental characters pointed out as distinguishing this type specimen from *M. v. velifer* are extremely variable in any population of *M. velifer.*

Figures 1-6 illustrate this variation. Two specimens from the same locality may show differing degrees of overlapping of lower incisors (Figs. 1, 2), while the crowded and uncrowded condition of the second lower premolar may be found in specimens from the same locality in México (Figs. 3, 4) as well as in specimens from the same locality in Guatemala (Figs. 5, 6). These characters unfortunately cannot serve as indices of geographic variation.

The type is an adult or a near adult, since the metacarpal and phalangeal epiphyses give no clear evidence of immaturity. Even if the skull is of a young adult, the cranial characters, well described by Goodwin, do not seem to be those of a young *M. v. velifer,* since the immature *M. v. velifer* also differ from *M. v. cobanensis* in these respects. The short rostrum, the more globular braincase, and the height of the braincase above the rostrum, are characters which I do not see expressed in specimens of *M. v. velifer.*

In view of the clear occurrence of typical *M. v. velifer* in Guatemala, and in the absence in the Guatemalan populations of any evidence of morphological intermediacy between the characters of *M. v. velifer* and *M. v. cobanensis,* it seems incorrect to continue to regard *cobanensis* as a subspecies of *M. velifer,* but must be regarded as a different species, *Myotis cobanensis* Goodwin. Its relationship to other named species or its possible identity with some already described species must await further study.

Vol. 71, pp. 171-172 December 31, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF CINARA (APHIDAE) FROM NORTH DAKOTA

F. C. HOTTES

I am indebted to Prof. M. A. Palmer for her valued opinion concerning the new species described herewith, and to Miss Louise M. Russell of the United States National Museum for sending me the material from which it is described.

Cinara jucunda n. sp.

Apterous viviparous female.

Length from vertex to end of abdomen varying from 2.70-3.00mm. Color of living specimens not recorded, as represented by cleared mounted specimens as follows: first antennal segment concolorous with head which is brown, second antennal segment not quite as dark as first. Third antennal segment pale dusky, almost uniform in color, fourth antennal segment concolorous with third for most of length, but with apex slightly darker. Fifth antennal segment with basal half pale and the apical half dusky brown. Sixth antennal segment uniform brown. Prothorax with dorsum brown. Dorsum of meso and metathorax with lateral areas dark brown. All femora with basal regions pale dusky and apical regions darker. All tibiae with a short region near base dark brown, this followed by a pale region which extends beyond middle of pro and mesothoracic legs, and to middle of metathoracic tibiae. Tarsal segments brown. Cornicles brown. Dorsum of abdomen with or without small irregular pigmented spots anterior to transverse pigmented areas.

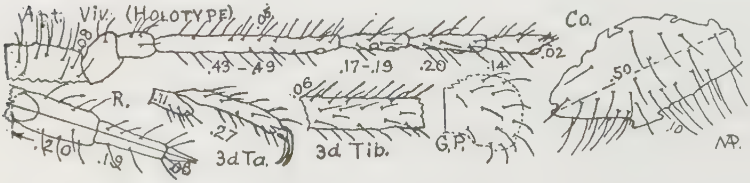
Head and thorax.—Ocular tubercles small. Median transverse suture of head pale, narrow. Antennal segments with the following lengths: III .43 — .49mm., IV .17 — .19mm., V .20mm., VI .14 + .02mm. Third antennal segment with or without one secondary sensorium, fourth and fifth antennal segments each with one secondary sensorium. Primary sensorium on third antennal segment small. Marginal sensoria on sixth antennal segment almost all basal to sensorium and more or less in a row. Hairs on dorsum of head about .08mm. in length. Hairs on antennae upstanding, comparatively few, on third segment varying from .03 — .06mm. in length. No specimen with rostrum fully extended, last three segments of the rostrum with the following lengths: .20, .19 and .08mm. Mesosternal tubercle absent. Prothoracic femora varying in length from

.72 — .82mm. Prothoracic tibiae varying in length from .93 — 1.05mm. Metathoracic femora varying in length from .97 — 1.125mm. Metathoracic tibiae varying from 1.50 — 1.87mm. Minimum lengths for these segments represented by one specimen. Metathoracic tarsal segments .11 and .27mm. in length. Hairs on anterior margin of metathoracic femora about .06mm. in length, other hairs on this segment about the same length and quality. Hairs on outer margin of metathoracic tibiae irregular in length varying from .04 to .06mm. in length, all shorter than width of segment, upstanding, but less so near apex. Hairs on inner margin of metathoracic tibiae slightly shorter, less upstanding, and finer than the hairs on the outer margin, but more uniform in length. Ventral surface of first metathoracic tarsal segment with about ten hairs. Hairs on ventral surface of second metatarsal segment more numerous than the hairs on the dorsal surface, with the hairs on the dorsal surface normally longest.

Abdomen.—Hairs on dorsum of abdomen fairly numerous, rather coarse, about .09mm. in length, hairs on ventral surface much more numerous, varying in length, the longest about .06mm. long. Cornicles with base varying in width from .45 — .52mm. Outer margin of cornicles irregular, but not deeply notched. Hairs on cornicles about .10mm. in length, the hairs on the inner surface being shorter and finer as well as more numerous than the hairs near the margin. Genital plate indented front and rear, with the hairs confined to the ends. Transverse pigmented spots long and with the ends irregular, provided with two rows of hairs along the posterior margins, the hairs being more numerous in the posterior row. Hairs on cauda confined almost totally to posterior margin which is deeply pigmented and with a setulose surface.

This species shows affinity to *C. pallidipes* H. and differs from that species in larger size, longer antennal segments, longer legs and larger cornicles, fewer hairs on the outer margin of the metathoracic tibiae, these hairs are also shorter.

Holotype apterous viviparous female, deposited in the United States National Museum. Data on holotype slide as follows: On Colorado and Black Hills Spruce, Bismarck, N. D. June 16, 1958 V. Goodfellow. As there are only four specimens, it is hardly likely that they were taken on two species of spruce. I suspect that the specimens were taken on Black Hills Spruce (*Picea glauca*).



Cinara jucunda n.sp.

Vol. 71, pp. 173-178 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PILL MILLIPEDS (DESMONIDAE, POLYDESMIDA) IN THE UNITED STATES

By Nell B. Causey

Fayetteville, Arkansas

Earlier papers on the millipeds of the family Desmonidae in the United States are by Bollman (1888, 1893), Cook (1898), and Loomis (1943). These writers described one species from each of the states of Alabama, Arkansas, and Oklahoma. In this paper I have added records from seven other states and descriptions of two new species and one new subspecies. The type specimens will be deposited in the American Museum of Natural History.

I am greatly indebted to Dr. David Causey, who aided in making most of the collections, and to Mr. Walter Harman, Dr. D. L. Wray, and Dr. M. L. Sanderson, for one collection each.

Millipeds representing two genera of the family Desmonidae are known from the southern United States. *Desmonus earlei,* with 20 body segments, has been collected from an area that extends from southeastern Kentucky through eastern Tennessee, Georgia, Alabama, and into western Florida. Another species with 20 body segments, *Desmonus pudicus,* is known from a limited area from central Arkansas; and two species, each with 19 body segments, occur in western Arkansas and adjacent areas of Missouri, Texas, and Louisiana. The monotypic genus *Desmoniella* has been collected only in central Oklahoma. The family is probably much more widely distributed in the southern United States than the present records indicate.

I have collected these millipeds from a variety of habitats in either deep or sparse litter, on moss, or in decaying logs in hardwood, pine, and mixed forests. They have been found in two sites with other pill millipeds of the genus *Onomeris,* order Oniscomorpha.

Key to the Desmonidae of the United States Based on Somatic characeters of Mature Specimens

1a. Lobes of the second body segment about as long and as broad as the lobes of the third segment; 19 body segments .... *Desmoniella curta*

1b. Lobes of the second body segment much shorter and narrower than the lobes of the third segment; either 19 or 20 body segments .... *Desmonus* 2

2a. 20 body segments 3
2b. 19 body segments 5
3a. Surface smooth, shining, without adhering mucus and soil particles; tubercles on segments 16 through 19 .... *pudicus*
3b. Surface finely granular, with adhering mucus and soil particles; tubercles, either distinct or indistinct, on segments 4 through 20 4
4a. Segments 5 through 19 with prominent, erect, distinct tubercles .... *earlei earlei*
4b. Most tubercles indistinct; only on segments 17, 18, and 19 are they erect and distinct .... *earlei mancus*, new subspecies
5a. Tubercles usually prominent and distinct on all segments from 5 through 18 or 19. Body moderately moniliform. .... *inordinatus*, new name
5b. Tubercles absent from all except the last three or four segments, where they are very small. Body very slightly moniliform .... *austrus*, new species

Genus **Desmoniella**

Desmoniella Loomis, 1943, Bull. Mus. Comp. Zool. Harvard, vol. 92, no. 7, p. 400 (*Desmoniella curta*).

This genus is very distinct from *Desmonus* in the shape of the lateral lobes of the second and third body segments and in the presence of lateral pits on only segments 4 through 10. The gonopods are similar in the two genera.

Genus **Desmonus**

Desmonus Cook, 1898, Proc. U. S. Nat. Mus., vol. 21, no. 1154, p. 463 (*Desmonus earlei*).

This genus is unusual in that some species have 19 body segments and others have 20. The body length is between 4.5 and 8.5 mm. The shape of the lateral lobes of the adult stadium is constant throughout the genus. The gonopods and the J-shaped third article of the first legs of the male are almost constant in shape throughout the genus. The lateral pits begin on segment 3 in all species and continue through the last segment in some species; in others it has not been possible to determine definitely where the lateral pits leave off. All species except *D. pudicus* have the body surface sparsely to thickly covered with mucus and soil particles. All species have tubercles on one or more segments. The tubercles are arranged in transverse series of from 6 to 12, with the one or either side of the medial pair always a little anterior to the others in the series. Tubercles may be conspicuous, erect, and conical, or they may be flattened and inconspicuous. Each tubercle has a seta at its apex.

The larvae lack mucus and have very few tubercles. The lateral lobes of the second segment are broader and longer than in the adult stadium, closely resembling the shape of those lobes in the last stadium of the genus *Desmoniella*.

Desmonus earlei earlei

Desmonus earlei Cook, 1898, Proc. U. S. Nat. Mus., vol. 21, no. 1154, 463-465, pl. 32, figs. 1a-1n (Auburn, Lee Co., *Alabama*).

The adult specimens in my collection conform closely to the description of the species. The larvae are smooth, shining, and with tubercles on only the last three or four segments.

New records: *Georgia*: DeKalb Co., Stone Mountain, 1 ♀, June 16, 1958; tubercles less conspicuous than observed in any other specimens of this subspecies: larvae, Sept. 14, 1954, D. L. Wray. Fulton Co., Bankhead Lake, 1 ♂, 2♀, June 16, 1958.

Kentucky: Bell Co., Pine Mountain State Park, 1 ♂, June 16, 1940. Whitley Co., Cumberland Falls State Park, 1 ♂, 1 ♀, larvae, June 17, 1940.

Tennessee: Campbell Co., Norris Park, 1 ♂, June 18, 1940.

Desmonus earlei mancus, new subspecies

Diagnosis: Differs from *Desmonus e. earlei* in the smaller size of the body, the degenerate tubercles, and shorter setae.

Description of female holotype: Body width 1.8 mm. In alcohol without color except the sparse patches of tan mucus. Surface of tergites unevenly granular. Segments 5 through 16 each with a transverse row of 8 or 10 very obscure tubercles, the position of each one marked by a short seta. Segments 17, 18, and 19 have more distinct, conical tubercles; on segment 19 the tubercles are nearly as large as on that segment of *D. e. earlei.* On the anal tergite there is a pair of low, irregular tubercles. Lateral pits can be seen distinctly on segments 3 through 16.

Type locality: *Florida:* Jackson Co., Florida Caverns State Park, 1 ♀, in moss on rock in dense woods at entrance to natural bridge, May 27, 1958.

Other record: *Georgia:* Polk Co., Highway 161, 9 miles west of Centerton, hardwood forest, 1♀, June 17, 1958. This specimen has light brown antennae; in all other characters it is like the holotype.

Desmonus pudicus

Figure 1

[*partim*] *Spheriodesmus pudicus* Bollman, 1888, Ent. Amer., vol. 4, p. 3; 1893, Bull. U. S. Nat. Mus., no. 46, p. 75 (Little Rock, Pulaski Co., and Okolona., Clark Co., *Arkansas*).

[*non*] *Desmonus pudicus* (Bollman). Cook, 1898, Proc. U. S. Nat. Mus., vol. 21, no. 1154, pp. 465-466, pl. 32, figs. 2a, 2b.

Restricted type locality: *Arkansas:* Pulaski Co., Little Rock.

In life the color is pink above, fading to cream below. In alcohol the pink fades quickly and narrow gray bands appear on the head, antennae, and across the tergites. Surface of tergites smooth and shining, without colored mucus and adhering soil particles. Segments 16 through 19 each with a transverse series of about 8 small tubercles. They are largest on segment 19 and progressively smaller on the preceding segments. Segment 20 and the segments anterior to 16 have no indication of tubercles except a single seta in the position that is occupied by each tubercle in the other species. Lateral pits on segments 3 through 20, very difficult to see on segments 14 through 20.

The gonopods (Fig. 1) are very similar to those of the other species of the genus except that the tibiotarsal region is slightly broader; the apical region of each of its two rami is divided into three minute divisions, which are rounded on the posterior ramus and acute on the lateral or anterior ramus.

New record: *Arkansas:* Pulaski Co., Sweet Home, mixed woods, 2 ♂, 6 ♀, many larvae, Dec. 22, 1949. This site is now occupied by a new housing development.

As discussed more fully in the section of *Desmonius inordinatus,* neither Bollman nor Cook realized that the two pill millipeds in Bollman's collection from Arkansas represent two different species. Bollman's description was based on the Little Rock specimen, which was lost before Cook studied the remaining specimen from Oklona.

Desmonus inordinatus, new name

Figure 2

Desmonus pudicus (Bollman). Cook, 1898, Proc. U. S. Nat. Mus., vol. 21, no. 1154, pp. 465-466, pl. 32, figs. 2a, 2b.

Diagnosis: Similar to *D. earlei earlei* in the size of the tubercles; distinguished from that species by having 19 body segments instead of 20.

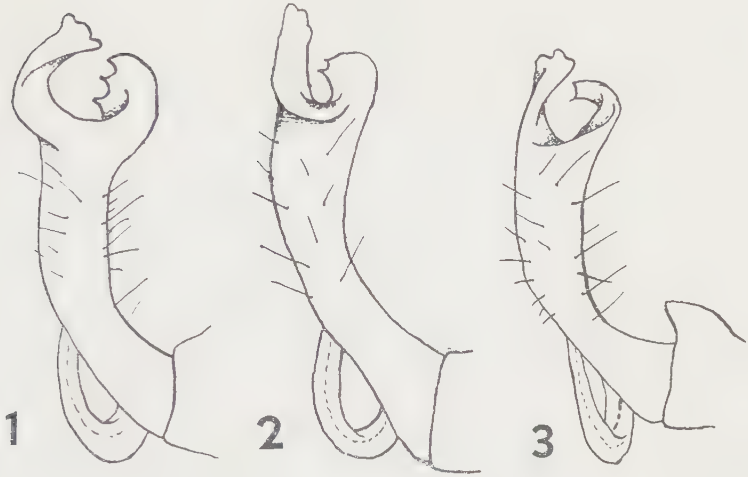
Type locality: *Arkansas:* Clark Co., Okolona.

Description of female holotype: Length about 6.5 mm. In alcohol the body is without pigment other than the abundant tan mucus and adherent soil particles. Surface of tergites finely granular. Beginning indistinctly on segment 4 and continuing much more distinctly on segments 5 through 18, each metatergite has a transverse series of 8, 10, or 12 tubercles. As in *D. earlei earlei* each tubercle has a seta at its apex, and the tubercles on each side of the middle pair in each series is somewhat smaller than those between which it stands and is slightly in front of them. Dorsal tubercles larger than the lateral ones in each series. On the 3 or 4 segments preceding the caudal segment the tubercles are acute and have a distinctly caudal slant. Caudal tergite with a pair of low, broad tubercles. Lateral pits on segments 3 through 13 easily seen; pits continue through segment 19.

In this species the gonopods (Fig. 2) are almost indistinguishable from others in the genus. The posterior ramus of the tibiotarsus is divided into three minute, rounded divisions, and the lateral or anterior ramus into two minute acute divisions.

Variations: The specimens from Clark, Pike, and Polk counties all have large, conspicuous tubercles. In collections made north of the Arkansas River, there is some variation in the tuberculation. Occasional specimens have very flat tubercles. Both strongly and weakly tuberculate forms may appear together in the same collection. Both forms are moderately moniliform, a character which easily distinguishes the weakly tuberculate form from the very weakly moniliform species *D. austrus.* In the following list of collections, all mature specimens have strong, conspicuous tubercles except those specifically mentioned as having degenerate tuberculation.

Records: *Arkansas:* Benton Co., Monte Ne, 1 ♀, Nov. 19, 1949; Cave Springs, larvae, May 8, 1951. Carroll Co., Lake Leatherwood, 1 ♂, 1 ♀, June 30, 1950. Clark Co., roadside park 4 miles east of Arkadelphia, hardwood forest, thin litter, gravelly soil, 2 ♂, 3 ♀, Sept. 11, 1950; 15 miles east of Okolona on highway 51, under cedar tree, 1 ♀, larvae, Sept. 11, 1950; Johnson Co., 1 ♀, tubercles degenerate, May 30, 1951. Newton Co., Compton, 1 ♀, tubercles degenerate, larvae, July 13, 1940. Pike Co., Antoine, mixed woods, sandy soil, 3 ♂, June 8, 1951. Polk Co., Rich Mountain, west side near summit, hickory forest, 1 ♂, Sept. 7, 1950. Sebastian Co., 3 miles north of Hackett, highway 71, thin oak litter, 1 ♀,



Explanation of Figures

Figure 1. *Desmonus pudicus* (Bollman), Sweet Home, Pulaski Co., Arkansas.

Figure 2. *Desmonus inordinatus,* new species, Fayetteville, Washington Arkansas.

Figure 3. *Desmonus austrus,* new species, Claiborne Par., Louisiana.

All figures are of the left gonopod, sublateral view, and are drawn to the same scale.

Sept. 1, 1950, Washington Co., numerous collections from Devil's Den State Park, Mount Sequoyah, West Fork, Farmington, Goshen, and Spring Valley; in most collections there are specimens with degenerate tubercles as well as specimens with very distinct tubercles. Conway Co., Petit Jean State Park, 1 ♂, 4 ♀, larvae, May 5, 1950.

Missouri: Barry Co., Mark Twain National Forest, oak-hickory forest, 2 ♂, May 3, 1951.

Bollman's collection which he named *Speriodesmus pudicus* consisted of two specimens, one from Little Rock and the other from Okolona. The male, which was designated as the type of the species, was subsequently lost; my specimens from Sweet Home, south of Little Rock, agree with its description. The female was therefore the specimen collected at Okolona; Cook found it in the United States National Museum and described it as follows:

> Closely allied to the preceding [*D. earlei*], but distinct in the much less prominent elevations of the segments. The surface itself, however, seems to be rougher than in *D. earlei* and the adherent matter is more abundant, giving the creature a more uniform and darker color.[1]
>
> [1] Cook (1898, p. 466)

Cook noted the discrepancy between his description of the female and Bollman's description of the male, but explained that it was due to the latter's description having been drawn partly from living material.

Desmonus austrus, new species

Figure 3

Diagnosis: Similar to *D. pudicus* in the almost complete absence of tubercles and in the weakly moniliform appearance; distinguished from that species by having 19 body segments instead of 20.

Type locality: *Arkansas:* Columbia Co., Magnolia.

Description of male and female syntypes: Length of male 5 mm., length of female 6 mm. Shape of lateral lobes as in other species of the genus. In alcohol the color is light tan. Surface of tergites slightly roughened, shining under the thin layer of mucus. The two or three segments preceding the caudal segment have four or six very small erect tubercles on the caudal margin. Segment 19 with a pair of low, irregular tubercles. All segments with a transverse series of about 12 short setae. Lateral pores on segments 3 through 19.

The gonopods are almost indistinguishable from those of *D. inordinatus.*

Variation: The specimens from Sevier county were pale pink when collected. Those from Cass county are the smallest seen, the length being about 4.5 mm.; they have no tubercles.

Records: *Arkansas:* Columbia Co., 4 miles east of Magnolia, mixed woods, deep litter, several of each sex, Dec. 22, 1949 (type collection); Lumber, 1♀, Dec. 22, 1949. Sevier Co., Wilton, 1 ♂, several ♀, larvae, Dec. 23, 1950.

Louisiana: Claiborne Par., about 5 miles south of Junction City, several of each sex, larvae, Dec. 24, 1949. *Lincoln* Par., 1♀, Oct., 1950, W. Harman. Winn Par., 1 ♀, June 11, 1951.

Texas: Cass Co., Linden, 2 ♂, Apr. 9, 1950, Smith and Berger.

Desmonus sp.

Tennessee: Sevier Co., Great Smoky Mountains National Park, larvae, June 21, 1940.

Vol. 71, pp. 179-184 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW RECORDS AND DESCRIPTIONS OF A NEW GENUS AND A NEW SPECIES OF MILLIPEDS OF THE FAMILY STRIARIIDAE (CHORDEUMIDA)

Nell B. Causey
Fayetteville, Arkansas

The seldom collected, very slow moving, little millipeds of the North American family Striariidae are known from two areas, one eastern and the other western. The genera *Amplaria Striaria,* and *Vaferaria,* n. gen., occur in Oregon and California, while only the genus *Striaria* has been found in an area extending from Maryland to Indiana and south into Georgia. This family has been the subject of two papers (Cook 1899, Loomis 1936), but most of the records are fragmentary, and much work remains to be done on the group, both collection and description.[1]

Most collections of striariids have been made in damp humus of hardwood forests, but Cook (1899) reported that in rather dry open woods in the District of Columbia *Striaria columbiana* outnumbered all other millipeds. The three species that have been collected in caves do not show obvious modification to cave life other than reduction of pigment of the body or of the ocelli. One species is known from fossils, probably of Pleistocene time, as well as from recent collections.

Mature specimens have been collected in all seasons, but mature males are very scarce in collections and are unknown for some species. The anterior gonopods are complex, with the coxite and the telopodite about the same length and each usually with several branches. The coxite is easily seen and is a reliable taxonomic character. Somatic characters, such as color, size, number of ocelli, number and height of crests, density of granules, and shape of the anal tergite, are useful taxonomic characters for both sexes.

KEY TO THE GENERA OF STRIARIIDAE

1. Dorsal surface of body strongly flattened, especially at the anterior end. Mature males without labral spines .... *Vaferaria,* n. gen.

---

[1] I am very grateful to the following people for the opportunity of studying the specimens of millipeds recorded in this paper: Dr. T. C. Barr, Jr., Dr. H. P. Chandler, Dr. Robert deSaussure, Dr. Eugene N. Kozloff, and Dr. D. L. Wray. The assistance of Dr. H. F. Garner with the fossil specimens is also gratefully acknowledged.

Dorsal surface of body usually rounded, if flattened, only slightly. Mature males with labral spines in all species in which males have been described 2

2. Eyes with 2 or 3 ocelli. Medial pair of crests thinner and more depressed than any others on all body segments. Collum with a deep transverse furrow. Not known whether males have labral spines .... *Amplaria*

Eyes with 5 or more ocelli. Medial pair of crests as large as any others on all segments except the first. Collum without a deep transverse furrow. Mature male with 2 labral spines........ *Striaria*

Genus *Amplaria* Chamberlin

Amplaria Chamberlin, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no.5, p. 9.

This genus includes the species *eutypa* Chamberlin and *nazinta* (Chamberlin). The presence of 12 crests on the collum is not a good diagnostic character for this genus.

Amplaria nazinta (Chamberlin)

Striaria nazinta Chamberlin, 1910, Ann. Ent. Soc. Amer., vol. 3, no. 4, pp. 242-243, pl. 35, figs. 2-6 (Portland, Oregon). Loomis, 1936, Jour. Washington Acad. Sci., vol. 26, no. 10, p. 408.

Amplaria nazinta, Chamberlin, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 5, p. 9.

Oregon record.—Multnomah Co.: Portland, Skyline Blvd., in leaf mold in burned over forest, 1 ♂ of 28 segments, Apr. 28, 1957, Dale B. Monroe. This larva differs from the description of the female holotype in that on the collum there are 10 rather than 12 crests, the labrum has three teeth rather than two, and the eyes are composed of three distinct ocelli. The most striking characters of this species are the thick transverse ridge across the anterior surface of the collum and the reduction in height and thickness of the medial pair of crests on all segments.

Genus *Striaria* Bollman

Striaria Bollman, 1888, Ann. New York Acad. Sci., vol. 4, p. 108. Cook, 1899, Proc. U. S. Nat. Mus., vol. 21, pp. 671-672. Loomis, 1936, Jour. Washington Acad. Sci., vol. 26, no. 10, pp. 405-406.

This genus includes the species *californica* Cook, *carmela* Chamberlin, *eldora* Chamberlin, *nana* Loomis, and *shastae*, n. sp., from California, *antica* Causey from Indiana, *causeyae* Chamberlin from North Carolina, *columbia* Cook from the District of Columbia and Maryland, and *granulosa* Bollman from Tennessee, Kentucky, North Carolina, and Georgia.

Striaria antica Causey

Striaria antica Causey, 1952, Proc. Biol. Soc. Wash., vol. 65, p. 112, figs. 1-3 (Montgomery Co., Indiana).

Several corrections and additions should be made to the description of this species. The length of the collum is twice the length of the posterior subsegment of the second segment. The collum has 12 dorsal crests, of which the ventral one on each side is rudimentary; the other 10 crests are as thick as crests on the second segment. The ventral margin of the second segment is almost parallel with the sixth dorsal crest of that segment, and the distance between them is very slightly greater than the distance between the fifth and sixth crests; the anterio-ventral corner of the ventral lobe is a right angle. Both the anterior and posterior margins of the posterior subsegments of segments 2, 3, and 4, as observed, from a dorsal view, are in the form of broad obtuse angles instead of being straight or slightly rounded.

Striaria californica Cook

Striaria californica Cook, 1899, Proc. U. S. Nat. Mus., vol. 21, p. 675, pl. 53, fig. 2a (Marin Co., California). Loomis, 1936, Jour. Washington Acad. Sci., vol. 26, no. 10, p. 409, fig. 1f (Santa Cruz and Solano Cos., California).

California record: Marin Co., Lagunetas, 1 ♀, Apr. 7, 1943, H. P. Chandler. Length about 18mm., width 1.8mm., eyes composed of 9 or 10 ocelli, body pale brown in alcohol, ventral margin of collum with a shallow emargination near the posterior angle, angle formed by projection of ventral crest and sixth dorsal crest of second segment about 60 degrees.

Striaria causeyae Chamberlin

Striaria causeyae Chamberlin, 1940, Canadian Ent., vol. 72, p. 58 (Durham Co., North Crarolina).

North Carolina record: Wake Co.: Raleigh, 1 ♂ of 28 segments, in leaf mold, May 10, 1950, D. L. Wray. This larva differs from the description of the male holotype in that the sixth pair of dorsal crests of the collum are rudimentary and the eyes have six ocelli. All crests and marginal ridges are lighter in color than the background color; posterior subsegments and collum darker than anterior subsegments; posterior subsegments have near their posterior margin a dark line that is emarginate between the crests; no longitudinal lateral bands. The sinuses that separate the three lobes of the anal tergite are deep and narrow, with the apices of the sinuses narrowly rounded.

Striaria granulosa Bollman

Striaria granulosa Bollman, 1888, Ann. New York Acad. Sci., vol. 4, p. 108 (Jefferson Co., Tennessee); 1893, Bull. U. S. Nat. Mus., no. 46, p. 83. Cook, 1899, Proc. U. S. Nat. Mus., vol, 21, no. 1169, pp. 672-674, pl. 53, figs. 1a-1j. Loomis, 1936, Jour. Washington Acad. Sci., vol. 26, no. 10, p. 409.

Striaria zygoleuca Hoffman, 1950, Jour. E. Mitchell Sci. Soc., vol. 66, no. 1, pp. 16-17, pl. 5, fig. 3 (Macon Co., North Carolina).

Georgia record: De Kalb Co.: Stone Mountain, 5462 Memorial Drive, 1 ♂ of 28 segments, in leaf mold, June 16, 1958, N. B. Causey.

Kentucky record: Bell Co.: Pine Mountain State Park, 2 larvae of 28 segments, June 17, 1940, N. B. Causey.

North Carolina records: Cabarrus Co.: Mount Pisgah, 1 ♀, Sept. 28, 1950; 2 ♂, Oct. 5, 1949. Henderson Co.: Bat Cave, 1 ♀ of 28 segments, May 15, 1950. Watauga Co.: Grandfather Mountain, larvae of 26 segments, Nov. 15, 1950. Yancy Co.: Mount Mitchell, 1 ♂ of 28 segments, Sept. 29, 1950; larvae of 26 segments, July 25, 1951. All of the North Carolina collections were made by D. L. Wray.

Striaria shastae, new species

Diagnosis: A cavernicolous species, the largest of the genus, distinguished by the reduction of body pigment, by the shallow body crests, and by the reduced number of crests, five pairs instead of six pairs, on the segments of the posterior half of the body.

Description of female syntypes: Length of largest specimen about 25mm., width 2.4mm. Color in alcohol from light tan to nearly white. Eyes with 7 or 8 black ocelli in 2 irregular rows.

Collum with 5 pairs of crests of equal height; below them is a sixth pair of shorter, or rudimentary, crests of the same height, but not reaching the posterior margin; in front of the middle three pairs of crests is the usual swollen area that is typical of the genus. Crests of segments 2 through 4 of equal height, slightly higher than those of the collum. Beginning with segment 5 the crests, especially the sixth pair, become progressively shallower; the sixth pair drops out entirely by segment 13 or 14, leaving only 5 pairs on segment 14 through 29. Ventral or marginal crests unusual in that at the anterior end they turn back and up, forming an acute tooth. Distance between the sixth crest of middle body segments and ventral crests is 4 or 5 times the distance between crests 5 and 6. Ventral lobes of second segment nearly horizontal, the anterio-ventral angle oblique, its apex rounded; distance from ventral margin to sixth crest, as measured along the posterior margin of the posterior subsegment, 3 times the distance between crests 5 and 6; along the anterior margin, the distance is twice the distance between crests 5 and 6. Posterior margins of segments 2, 3, and 4, as viewed from above, straight. Segmental setae aciculate, about one-fourth the length of the dorsal crests. Surface of collum between crests thickly and coarsely granular; on the following segments the granules become progressively smaller and slightly sparser; much sparser on the sides, which are shining. Caudal tergite thickly granular, its medial lobe twice as wide and slightly longer than the lateral lobes, the sinuses between them relatively deep, open, the sides parallel and the apices narrowly rounded.

Mature males are unknown.

Type locality: *California*: Shasta Co.: Samwel Cave, from guano solution bowl, passage to guano solution bowl, and bottom of a pit 90 feet deep; all collections in total darkness; larvae of 23 segments, Jan. 7, 1957; larvae of 18, 28 segments, June 8, 1958; 1 ♀, larvae of 15, 18, 28 segments, June 11, 1958; all collections by R. deSaussure and R. Graham. Fossilized fragments of 3 specimens, in bone and dirt rubble from a filled crack, June 7, 1957, N. Slusser.

Striaria spp.

California record: Contra Costa Co.: Mount Diablo, altitude 3000 feet, 1 ♀ of 28 segments, May 8, 1947, H. P. Chandler. Length about 12mm., width 1.4mm., eyes with 5 ocelli in 2 uneven series.

Kentucky record: Franklin Co.: Hoy Cave 1 ♀ of 28 segments, L. Hubricht. Length about 12mm., width 1.1mm., eyes with 6 and 5 black ocelli in 2 uneven series, color tan, very near *S. columbiana* in many somatic features.

Genus **Vaferaria**, new genus

Diagnosis: Distinguished especially by the absence of spines on the labrum of mature males and by the flattened dorsal surface.

Type species: *Striaria imberbis* Loomis.

Description: Similar to other genera of the family in body size and in the arrangement of ocelli, granules and striae. Differs in the flattened dorsum, the narrowed head, and in the mature male, the absence of labral spines and the presence of a very large, bluntly conic lobe on the second segment of the second legs. The gonopods have not been described carefully.

Vaferaria imberbis (Loomis), new combination

Striaria imberbis Loomis, 1936, Jour. Washington Acad. Sci., vol. 26, no. 10, pp. 408-409, fig. 1D (San Luis Obispo Co., California).

BIBLIOGRAPHY OF THE STRIARIIDAE

Bollman, Charles H.

1888. Notes upon a collection of Myriapoda from East Tennessee, with description of a new genus and six new species. Ann. New York Acad. Sci., vol. 10, pp. 106-112 [1893. Myriapoda from East Tennessee, with a description of a new genus and six new species. Ann. New York Acad. Sci., vol. 10, pp. 106-112 [1893. Myriapoda of North America, pp. 81-85].

Causey, Nell B.

1952. Four new chordeumoid millipeds from the United States. Proc. Biol. Soc. Washington, vol. 65, pp. 111-118.

Chamberlin, R. V.

1910. Diplopoda from the Western States. Ann. Ent. Soc. Amer., vol. 3, no. 4, 233-262, pls. 30-43.

1940. On some chilopods and diplopods from North Carolina. Canad. Ent., vol. 72, pp. 56-59.

1941. New Western millipeds. Bull. Univ. Utah, biol. ser., vol. 6, no. 5, pp. 1-23, 3 pls.

1947. Seven new American millipeds. Proc. Biol. Soc. Wash., vol. 60, pp. 9-16, 1 pl.

1953. Two new millipeds taken in California Caves. Ent. News, vol. 64, pp. 93-95.

Cook, O. F.

1899. The diplopod family Striariidae. Proc. U. S. Nat. Mus., vol. 21, no. 1169, pp. 667-676, pls. 53, 54.

Hoffman, Richard L.

1950. Records and descriptions of diplopods from the southern Appalachians. Jour. E. Mitchell Sci. Soc., vol. 66, no. 1, pp. 11-33, pls. 5-8.

Loomis, H. F.

1936. New millipeds of the American family Striariidae. Jour. Washington Acad. Sci., vol. 26, no. 10, 404-409, 1 fig.

Vol. 71, pp. 185-186 December 31, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

OCCURRENCE OF THE CHILOPOD GENUS ETHMOSTIGMUS IN AMERICA

Ralph V. Chamberlin

In a collection of chilopods from California received for identification from the University of California, is a single specimen of a distinctly new species of the scolopendrid genus *Ethmostigmus.* This is of special interest from the point of view of distribution since the fifteen or so species heretofor known in the genus occur in the Ethiopean and Indo-Australian areas exclusively. The new species is here described.

Ethmostigmus californicus n. sp.

Dorsum olive brown in color, the posterior legs a lighter green or olive.

The antennae comparatively long, composed in the type of 19 articles all of which are longer than broad; the first three articles only are naked on the left antennae of the type, but on the right the fourth article is also naked except on the outer distal area where the fine short hairs are present as on subsequent articles, the absence of hair elsewhere on this article quite likely due to rubbing.

Prosternal teeth 3 — 3, the outermost tooth on each side small; dental plates set off by a transverse sulcus which forms a nearly right angle at the middle; a median longitudinal sulcus extending caudad nearly to middle of prosternum. (Cf. fig. 1.)

First sternite without sulci, but those from second to the penult marked with paired longitudinal sulci which are incomplete posteriorly.

Last ventral plate elongate trapeziform, its caudal margin incurved; Coxopleural processes long, these moderately converging caudad but not distally in contact, each with a single point or spine at distal end, behind which on the dorsal line are three denticles, with in addition two sublateral denticles of which the more distal one is subventral in position; upper margin of process viewed in profile is straight back to beginning of acuminate portion. Pores small and densely arranged, the poriferous area extending caudad close to end of the process. (Cf. figs. 2 and 3.)

Tarsal spines single on legs 1 to 19. Prefemur of anal legs with the caudal process ending in a single tooth which is moderately large; two spinules on the dorsomesal line, two on mesal side, two on ventromesal line and three on ventral line.

Length, 60mm.

Locality.—California, El Dorado Co., Snowline Camp. Holotype taken June 28, 1948.

This species is like *E. waiainus* of the Solomon Is., and *E. coonoranus* of India in having only the first three articles of the antennae naked or glabrous. From the first of these species it differs in having the apex of the coxopleural process with a single point instead of two, in having three dorsal spinules instead of one, and in having a tarsal spine on the nineteenth leg. From *coonoranus* it differs in having none of the legs with two tarsal spines, in not having the coxopleural process convex above, etc.

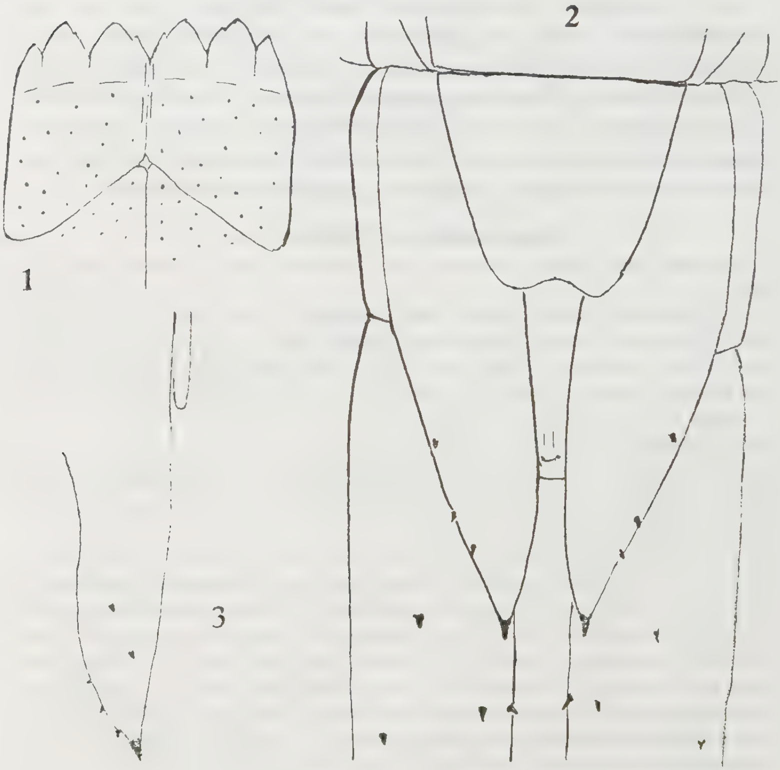


Fig. 1. Anterior portion of prosternum.
Fig. 2. Caudal end of body, ventral view.
Fig. 3. Lateral view of coxopleural process.

Vol. 71, pp. 187-190 December 31, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF CINARA FROM DELAWARE (APHIDAE)

F. C. Hottes

I am indebted to Miss Louise M. Russell of the United States National Museum for sending me the material from which this new species is described and to Mr. H. E. Milliron for collecting it.

Cinara tunicula n.sp.

Apterous viviparous female.

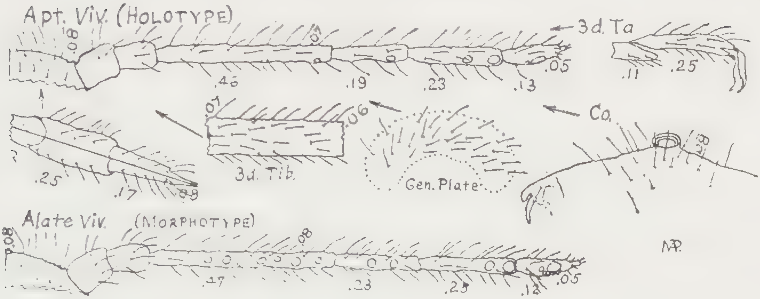
Size and general color.—Length from vertex to end of cauda varying from 3.15 - 3.33 mm. Color in life not recorded, as represented by cleared mounted specimens as follows: head and thorax dark dusky brown with margins slightly darker. Thorax with pigmented areas large, more or less united along mid line. Posterior dorsal pigmented area of the thorax less extensive, more fragmented in outline. Dorsum of abdomen covered for the most part by a large pigmented area which extends forward in the middle, and which engulfs the cornicles on the dorsum so that they are not differentiated from it except by form. Antennal segments one and two concolorous with head, segments three and four pale dusky with apical regions darker. Fifth antennal segment with basal half pale dusky, remainder of segment pale brown. All of sixth antennal segment pale brown. All femora yellowish at base shading to brown, the brown being more extensive and darker on the metathoracic femora. Pro and mesothoracic tibiae with a short region near base brown, this followed by an extensive pale dusky region which shades into brown near the apex. Metathoracic tibiae with a short region near base brown, this followed by a short pale region which shades quickly into brown, so that more than one half of this segment is brown. Tarsal segments brown.

Head and thorax.—Width of head through the eyes .66 mm. Ocular tubercles small but well developed. Median transverse suture not dark, narrow, more or less incomplete on anterior half. Hair on dorsum of head not numerous, failing to reach posterior margin of head and region adjacent to eyes, about .08 mm. in length. Antennal segments with the following lengths: III .34 - .49 mm., IV .18 - .21 mm., V .21 - .24 mm., VI .13 + .05 mm. Third antennal segment with or without primary sensorium. Fourth antennal segment with primary sensorium and with or without one small secondary sensorium. Fifth antennal segment with primary sensorium with a wide rim, and one secondary sensorium. Primary sensorium on sixth antennal segment with wide rim, marginal sensoria in a row. Sixth antennal segment weakly imbricated at base, the imbrications better developed towards apex. Hair on antennae sparse, very fine, longer on anterior margin where they vary in length from .03 - .07 mm. rather upstanding, slightly more numerous on posterior margin. Rostrum reaching mid region of cornicles, last three segments with the following lengths: .25, .17 and .08 mm. Hairs on rostrum quite numerous as well as long. Mesosternal tubercle a rounded hump provided with some hairs. Lengths of prothoracic femora and tibiae as follows: .93, 1.29 mm. Lengths of metathoracic femora and tibaie as follows: 1.46, 2.52 - 2.58 mm. Hairs on metathoracic femora few, fine, upstanding, more numerous on anterior margin. Hairs on metathoracic tibiae fine, much shorter on basal region than near apex, also fewer and finer on this region. Much more numerous on inner margin near apex than on outer margin. Hairs on outer margin in mid region varying from .06 - .07 mm. in length. First metatarsal segment .11 mm. in length, with about twelve hairs on the ventral surface. Second metatarsal segment varying in length from .25 - .27 mm. Hairs on the ventral surface of this segment more numerous than the hairs on the dorsal surface, but of the same quality.

Abdomen.—Pigmented area on dorsum almost free from hairs, the few present, too short to measure, arising from clear areas. Hairs on lateral portions of abdomen and non pigmented areas very fine, sparse, about .06 mm. in length. Hairs on cornicles very sparse, except on constricted area where they are not numerous. Hairs on cornicles similar as to type, fine, varying in length from .06 - .08 mm. Extent of cornicle difficult to determine from the dorsum, but this can be determined from the ventral surface. The cornicles are quite shallow. Transverse pigmented spot anterior to cauda wide, provided with very fine setulae, hairs confined to a row along the posterior margin, the hairs are few and fine. Hairs on cauda confined to posterior margin. Cauda and anal plate with setulae. Hairs on ventral surface of abdomen numerous, similar to those on the sides. Genital plate broadly rounded on anterior, deeply excavated on the posterior. Hairs on genital plate covering surface.

Alate viviparous female.

Length 3.09 mm. Antennal segments darker than in the apterous viviparous female. Median transverse suture of the head dark, well developed. Ocular tubercles small but well developed. Width of head through the eyes .66 mm. Color of legs quite similar to legs of apterous viviparous female. Pigmented spot on dorsum of abdomen lacking. Antennal segments with the following lengths: III .47 - .51 mm., IV .23 mm., V .23 - 25 mm., VI .12 + .05 mm. Secondary sensoria on third antennal segment arranged in a row, varying in number from four to six, not all of the same size. Secondary sensoria on fourth antennal segment varying in number from one to two. The fifth antennal segment has one secondary sensorium. All secondary sensoria have rather wide rims. Hairs on anterior margin of third antennal segment more numerous than hairs on this margin in the case of the apterous viviparous female. The hairs on the third antennal segment are set at an



Cinara tunicula n.sp.

angle of about 60 degrees on the anterior margin and about 45 degrees on the posterior margin. On the anterior margin they are about .08 mm. in length. Hairs on lateral lobes very sparse, fine, confined more or less to a row on the inner margin, middle region of lobe with only a few hairs. Rostrum reaching to posterior edge of cornicles. Second fork of media closer to margin of wing than to first fork. Hairs on metathoracic tibiae slightly more numerous than the hairs on this segment in the apterous female. Length of prothoracic femora and tibiae .93, 1.29 mm. Lengths of metathoracic femora and tibiae 1.46, 2.52 - 2.58 mm. Cornicles at base .39 mm. Hairs on cornicles sparse, but more numerous on constricted area. Cornicles of this form higher than the cornicles of the apterous form. Outer margin of cornicles irregular. Hairs on dorsum of abdomen not numerous, fine, about as long as the hairs on the cornicles varying from .08 - .09 mm. in length, spaced for the most part closer together than their length. Hairs on ventral surface of abdomen much more numerous than the hairs on the dorsum, slightly shorter and much coarser. Transverse pigmented spot anterior to cauda wide, with very few hairs on its posterior margin. Anterior to this spot there is a small pigmented spot with very short setulae and a few short hairs.

In Palmer's key to the genus Cinara in ''Aphids of the Rocky Mountain Region'' which does not cover the region from which this species came, it keys to *C. glabra* (G&P.) It differs from glabra in not having the dorsum of the abdomen clothed with setulae, and in having the cornicles incorporated in the dorsal pigmented spot. In glabra the genital plate is much larger and has fewer hairs.

The unguis of tunicula is also too short for glabra. This species will not key in Tissot's key to the genus *Cinara* Florida Entomologist Vol. XXII, 1939.

Holotype apterous viviparous female, morphotype alate viviparous female, both deposited in the United States National Museum. Host, *Pinus virginiana,* taken on older branches, by H. E. Milliron Petersburg, Delaware May 22 and May 29, 1957.

Vol. 71, pp. 191-196 December 31, 1958

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO ALLIED SPECIES OF CINARA (APHIDAE)

F. C. Hottes

It is now almost forty years since Wilson described *Lechniella pinivora* a species which has since been placed in the genus *Cinira*. Since that time, I am aware of no other material of this species having been taken. It has been keyed but once, by Wilson, in Hemiptera of Connecticut and has never been illustrated. I am indebted to the United States National Museum for the loan of the "type" slide, and to J. O. Pepper for sending me the material from which the new species is described, which he had determined as *pinivora*.

Cinara pinivora (Wilson)

Alate viviparous female.

Size and general color.—Length of uncleared specimens from vertex to end of cauda varying from 3.00-3.07mm. Color in life not recorded, as represented by mounted material as follows: Head and thorax dark dusky brown. Abdomen brown, with cornicles darker, the constricted area of the cornicles much so. First and second antennal segments concolorous with head. Third antennal segment with base pale, the extent of this region varying, but it may extend to middle or to second or third secondary sensorium, remainder of segment dusky. Fourth, fifth and sixth antennal segments uniform dusky, or with the basal portions of the fourth and fifth segments somewhat paler. Femora with basal halves yellowish, remainder of segment brown. Tibiae with basal region brown, or dark brown, this region about equal in length to the tarsal segments. This dark region is followed by a pale region which gradually shades into brown, this region may equal slightly more or less than one half of the total length. Tarsal segments concolorous with ends of tibiae. Transverse pigmented areas anterior to cauda divided, brownish, only slightly setulose. A few hairs on dorsum of abdomen arise from small irregular pigmented areas, these areas are larger towards the posterior.

Head and thorax.—Width of head through the eyes about .69mm. Length of antennal segments as follows: III .48 — .60mm., IV .18 — .225mm., V .22 — .28mm., VI .11 + .04mm. Hair on antennae not numerous, set at angle of about forty-five degrees, longer and coarser on anterior margin where the hair on the third segment vary from

.06 — .09mm. in length. Third and fourth antennal segments not smooth but not imbricated. Fifth antennal segment rougher than third and fourth, sixth segment imbricated, the imbrications being very distinct. Secondary sensoria distributed as follows: III 4 — 6 arranged in a row, varying in size, IV 0 — 1 as a rule none, V 0 — 1 as rule one. Only primary sensoria on fifth and sixth segments with wide rims. Marginal sensoria on sixth segment confined to a row not much longer than sensorium. Median transverse suture well developed, dark. Hairs on dorsum of head about .08mm. in length. Ocular tubercles fairly well developed. No specimen with rostrum fully extended. Last three segments of the rostrum with the following lengths: .19, .15, .08mm. Lateral lobes of thorax with numerous hairs on median half. Median posterior lobe of thorax almost free from hairs on anterior half. Triangular area between laterial and median posterior lobes with two hairs. Media twice forked, the second fork varying in position. All femora with numerous long fine hairs. The hairs on the anterior margin of the metathoracic femora being about .12mm. in length. Hairs on metathoracis tibiae numerous, set at an angle varying from 45-60 degrees, in length varying from .10 — .12mm. Hairs on inner margin of metathoracic tibiae numerous, set at an angle varying from 45-60 degrees, slightly shorter, with the hairs near the inner apex much shorter. Metathoracic tarsal segments .07 and .22 — .25mm. in length. Hairs on ventral surface of first metatarsal segment numbering about twelve. Hairs on dorsal surface of second metatarsal segment reclinate much longer than hairs on ventral surface.

Abdomen.—Hairs on dorsum of abdomen not numerous, varying slightly in length with the longest towards the posterior, spaced for the most part as far apart as their length which is about .09mm. Hairs on ventral surface of abdomen more numerous than those on the dorsum, and slightly finer. Hairs on transverse pigmented spots about .12mm. in length, confined to a row along the posterior margin. Cornicles with outer margin somewhat irregular, more or less oval in shape, being longer than wide, and with the constricted area closer to the posterior than to the anterior. The constricted area is rather high, and is sharply distinguished from the base. The hairs on the cornicles are fine, about .08mm. in length, evenly distributed over the surface and very few in number, the total number being about twenty. The surface of the abdomen is finely reticulated. The setulae on the transverse pigmented areas and on the genital plate are very poorly developed. The genital plate is quite small with the hairs confined largely to the ends, it is concave on its anterior and posterior margins. Hairs on cauda confined to posterior margin. Both the cauda and anal plate have setulae on the surface.

Lectotype alate viviparous female indicated by arrow on slide indicated as ''type'' by Wilson. Host *Pinus sp.* New York. 1908. Hopkins 7422. Slide on deposit in the United States National Museum.

Cinara harmonia n. sp.

Apterous viviparous female.

Size and general color.—Length from vertex to end of cauda varying from 3.67 — 3.90mm. Color notes taken from living specimens not complete, but described on slide as ''dark,'' ''greenish brown,'' ''brownish'' with the cornicles black. Color as represented by cleared mounted specimens as follows: Head, first and second antennal segments, and pro and mesothorax dusky brown. Mid region of metathorax with irregular patches of dusky brown. Third, fourth and fifth antennal segments very pale dusky with apical ends darker. All of sixth segment dusky brown. Basal fourth of pro and mesothoracic femora pale brownish, remainder brown. Basal half of metathoracic femora pale brownish but darker than basal region of other femora, remainder brown. Basal region of pro and mesothoracic tibiae dark dusky brown for a distance about equal to the length of the fourth antennal segment, this dark region followed by a pale dusky to pale brown region which gradually grows darker towards the apex, beyond the middle. Metathoracic tibiae similar to other tibiae except that the apical brown area is more extensive. Dorsum of abdomen with varying number of pigmented areas which vary greatly in size, number and shape, the larger being closer to posterior end.

Head and thorax.—Width of head through the eyes about .69mm. Ocular tubercles small but very protuberant. Median transverse suture well developed, brown. Hairs on dorsum of head fine, long varying from .10 — .11mm. in length. Antennal segments varying in length as follows: III .53 — .60mm., IV .21 — .27mm., V .27 — .30mm., VI .12 — .15 + .04mm. Secondary sensoria distributed as follows: III 0 — 1 as a rule one, IV 0 — 2 as a rule one, V 1 — 2 as a rule one. Hairs on antennal segments about .09mm. in length with those on the anterior margin more numerous, set at an angle of about sixty degrees. Brownish portion of fifth and all of sixth antennal segments imbricated, the imbrications being strongly developed on the sixth. Marginal sensoria in a row, extending basal to primary sensorium. Only primary sensoria on the fifth and sixth segments with wide rims. Rostrum when extended reaching to the cornicles, last three segments with the following lengths: .21, .19 and .10mm. Mesosternal tubercle present, with a very wide base, in shape more or less a rounded hump. Pro and metathoracic femora varying in length from 1.05 — 1.65 and 1.65 — 1.68mm. Only one specimen had prothoracic femora as long as 1.65mm. Lengths of pro and metathoracic tibiae varying in length as follows: 1.42 — 1.50 and 2.65 — 2.95mm. Hairs on outer margin of metathoracic tibiae quite similar to those on the inner margin, set at an angle of about 45 degrees, shorter than width of segment, about .09mm. in length. Hairs on dorsal surface of second metatarsal segment but little longer than those on ventral surface. Length of metatarsal segments about .105 and .30mm.

Abdomen.—Cornicles with base more or less oval, the outer margin irregular or slightly fragmented, measuring about .48 — .56mm. front to rear. Hairs on constricted area of cornicles much more numerous than hairs elsewhere, near the margin they are scarce. Dorsum of abdomen reticulated. Hairs on dorsum of abdomen rather sparse, farther apart than their length, varying from .08 — .09mm. Hairs on ventral surface of abdomen more numerous than the hairs on the dorsum, also shorter. Transverse pigmented spots anterior to cauda wide, almost joined by teeth, hair on these confined to a row along the posterior margin. Two pigmented areas are as a rule interior to these, they vary in size and shape. All such pigmented areas have very well developed setulae.

Alate viviparous female.

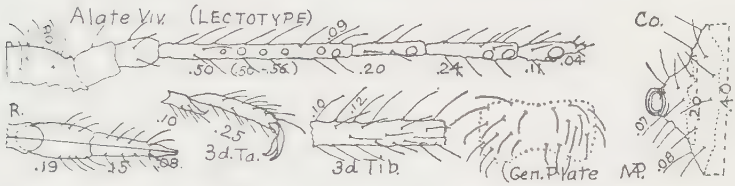
Size and general color.—Length from vertex to end of cauda varying from 2.92 — 4.2mm. Color of cleared specimens much like that of the apterous viviparous female, except that the metathoracic tibiae are apt to be darker, the pale area not so pale, or extensive, nor are the cornicles so dark.

Head and thorax.—Ocular tubercles small but protuberant. Width of head varying from .69 — .75mm. Antennal segments with the following lengths: III .52 — .60mm., IV .23 — .26mm., V .30 — 33mm., VI .12 — .13 + .04mm. Secondary sensoria distributed as follows: III 5 — 9, IV 1 — 3 as a rule one, V 0 — 1 as a rule one. On the third segment the secondary sensoria are arranged in a straight row, they are slightly tuberculent and vary in size. Hair on antennae not numerous, set at an angle of about 45 degrees, on third segment varying in length from .075 — .10mm. Hair on posterior margin of third segment less numerous than the hair on the anterior margin and only about .05mm. long. Rostrum when extended reaching to the middle of the cornicles and in one case to the genital plate. Last three segments of the rostrum with the following lengths: .21, .18 and .09mm. Hairs on lateral lobes of thorax numerous, covering slightly more than half of lobe. Triangular area between lateral lobes and median posterior lobe often with as many as four hairs. Lengths of pro and metathoracic femora varying as follows: 1.05 and 1.42 — 1.65mm. Lengths of pro and metathoracic tibiae varying as follows: 1.50 and .262 — 2.70mm. Hairs on metathoracic femora long and fine, numerous, more numerous on anterior margin, but no longer than hairs on posterior margin. Hairs on metathoracic tibiae varying in length from .10 — .111mm., numerous, same on outer and inner margins, except for shorter hairs on inner margin near apex. Metatarsal segments about .12 and .30mm. in length. Ventral surface of first metatarsal segment with about 12 hairs. Hairs on second metatarsal segment similar to those of viviparous female. Media twice forked, second fork as a rule closer to first fork than to margin of wing, base of media 1 and 2 often missing.

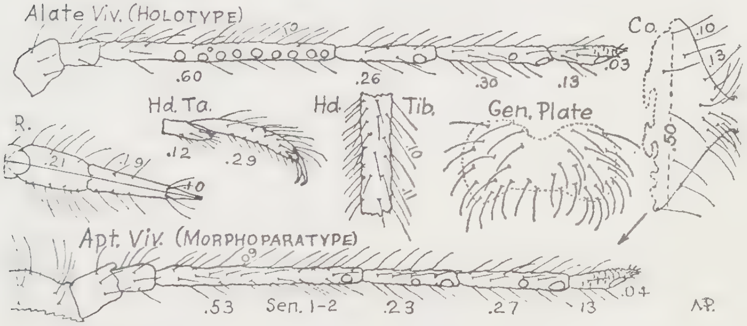
Abdomen.—Cornicles with outer margin in the form of a rounded oval with irregular outline. Constricted portion acentric, closer to posterior margin. Hairs on constricted area much more numerous than elsewhere, they being scarce near the outer margin. Constricted area of the cornicles not sharply distinct from base, the slope being quite gradual. Transverse pigmented areas anterior to cauda with well developed setulae. Hairs on these areas, with one or two exceptions confined to a row along posterior margin. Genital plate rather large with mid anterior and posterior regions recessed. Hairs on genital plate confined largely to ends. Hairs on dorsum of the abdomen for the most part closer together than their length which is about .07mm. Hairs on ventral surface of abdomen much more numerous, and only about .06mm. long.

This species is closely allied to *C. pinivora* (W) and keys to this species in Wilson's key, in Hemiptera of Connecticut. Only alates of Wilson's species are known. Alates of this species differ from alates of pinivora in the longer segments of the rostrum, more numerous hairs on the cornicles, and the uneven distribution of these hairs. The number of hairs on the cornicles being thirty or more, not twenty or less. The cornicles also differ in size and shape. The antennal segments of harmonia are longer, and there are more secondary sensoria on the third antennal segment. The metathoracic tibiae are darker.

Holotype alate viviparous female, morphotype apterous viviparous female. Host, red pine (*Pinus resinosa*) taken on two or three years old wood. J. O. Pepper, July 4, 1947, Philipsburg, Pennsylvania (Black Mosh. Dam). Type slides deposited in the United States National Museum.



Cinara pinivora (W)



Cinara harmonia n.sp.

Vol. 71, pp. 197-202 December 31, 1958

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A SUPPLEMENTARY LIST OF SPECIES AND RECORDS OF DISTRIBUTION FOR NORTH AMERICAN FRESHWATER OSTRACODA

Edward Ferguson, Jr.
Grambling College, Grambling, La.

The most recent list of North American freshwater ostracods was published by Tressler (1947). He records 204 species. This paper reports twenty-one new species of freshwater ostracods recorded from North America during the eleven year period 1947-1957 inclusive. Included also are three species, one by Klugh (1923) and two by Blake (1931), not mentioned by Tressler in his 1947 paper.

The classification followed is essentially that suggested by Hoff (1942).

New Species of North American Freshwater Ostracoda

Suborder Podocopa
  Family Cypridae
    Subfamily Candoninae
      Genus *Candona* Baird 1845
        C. hoffi Ferguson 1952—Maryland
        C. patzcuaro Tressler 1954—Mexico
        C. michoa Tressler 1954—Mexico
        C. hiplotensia Tressler 1954—Mexico
        C. orangeburgensis Ferguson 1958—South Carolina
    Subfamily Cyclocyprinae
      Genus *Candonocypris* Sars 1895
        C. deeveyi Tressler 1954—Texas
      Genus *Cyclocypris* Brady and Norman 1889
        C. castanea Klugh 1923—Canada
    Subfamily Cyprinae
      Genus *Cypricercus* Sars 1895
        C. serratus Tressler 1950—Wyoming
        C, tressleri Ferguson 1954—South Carolina
        C. cheboyganensis Ferguson 1957—Michigan
      Genus *Cyprinotus* Brady 1885
        C. sulphureus Blake 1931—Utah

        C. carolinensis Ferguson 1958—South Carolina
      Genus *Cypriconcha* Sars 1926
        C. macra Blake 1931 (= *Cypris grandis* Chambers 1877)—Col.
    Subfamily Cypridopsinae
      Genus *Cypridopsis* Brady 1867
        C. potamis Tressler 1954—Texas
        C. phantomensis Tressler 1954—Texas
        C. musquizensis Tressler 1954—Texas
        C. toyensis Tressler 1954—Texas
      Genus *Herpetocypris* Brady and Norman 1889
        H. pattersoni Tressler 1954—Texas
  Family Cytheridae
    Subfamily Limnocytherinae
      Genus *Limnocythere* Brady 1867
        L. itasca Cole 1949—Minnesota
    Subfamily Entocytherinae
      Genus *Entocythere* Marshall 1903
        E. caudata Kozloff 1955—Oregon
        E. daphinoides Hobbs 1955—West Virginia
        E. ericksoni Kozloff 1955—Oregon
        E. occidentalis Kozloff and Whitman 1954—Oregon
        E. runki Hobbs 1955—North Carolina; Virginia (Hobbs 1955); West Virginia (Hobbs 1955)

New Records of Distribution for North American Freshwater Ostracoda

Included in the following list are records of distribution for ostracods from Canada and Alaska not previously reported in any summary. These records were revealed unexpectedly by the discovery on pages 12 and 13 of G. O. Sars' 1926 paper on "Canadian and Alaskan Freshwater Ostracods" of a "List of Literature Recording Recent Freshwater Ostracods from Canada and Alaska" compiled by Frits Johansen. The following list is arranged in alphabetical order by genera and species.

  Suborder Podocopa
    Family Cypridae
      Genus *Candona* Baird 1845
        C. crogmaniani Turner 1894, Michigan (Kenk 1949)
        C. decora Furtos 1933, Michigan (Kenk 1949)
        C. elliptica Furtos 1933, South Carolina (Ferguson 1948)
        C. fabaeformis (S. Fischer 1851), South Carolina (Ferguson 1958)
        C. indigena Hoff 1942, Michigan (Ferguson 1957)
        C. intermedia Furtos 1933, Texas (Tressler 1954)
        C. simpsoni Sharpe 1897, Michigan (Moore 1939 and *C. exilis* Furtos 1933, and as *C. reflexa* Sharpe 1897)
      Genus *Chlamydotheca* Saussure 1858
        C. texasiensis (Baird 1862), Texas (Tressler 1954)
      Genus *Cypria* Zenker 1854
        C. exsculpta (S. Fischer 1855), Newfoundland (Alm 1914)
        C. inequivalva Turner 1893, South Carolina (Ferguson 1958)
        C. lacustris Sars 1891, Texas (Tressler 1954)
        C. obesa Sharpe 1897, Michigan (Ferguson 1957)

C. ophthalmica (Jurine 1820), South Carolina (Ferguson 1952b and 1958); Michigan (Ferguson 1957)
C. turneri Hoff 1942, Michigan (Kenk 1949 as *C. exculpta*), Cole 1953 as *C. exsculpta*), and (Ferguson 1957); South Carolina (Ferguson 1952b and 1958)
Genus *Cyclocypris* Brady and Norman 1889
C. castanea Klugh 1923, New Brunswick (Klugh 1923)
C. forbesi Sharpe 1897, South Carolina (Ferguson 1952b)
C. laevis (O. F. Müller 1785), Ontario (Klugh 1921 and 1923)
C. serena (Koch 1838), Ontario (Sars 1915)
C. sharpei Furtos 1933, South Carolina (Ferguson 1958)
Genus *Cypricercus* Sars 1895
C. reticulatus (Zaddach 1894), Ontario (Klugh 1921); New Brunswick (Klugh 1923)
C. tincta Furtos 1933, Michigan (Kenk 1949)
C. tuberculatus (Sharpe 1908), Ontario (Bigelow 1923); Michigan (Ferguson 1957)
Genus *Cypridopsis* Brady 1867
C. vidua (O. F. Müller 1776), Ontario (Klugh 1921); New Brunswick (Klugh 1923); Michigan (Kenk 1949), and (Ferguson 1957); Kansas (Leonard and Ponder 1949); Texas (Tressler 1954)
Genus *Cyprinotus* Brady 1885
C. dentatus (Sharpe 1910), Ontario (Klugh 1921); Texas (Tressler 1954)
C. incongruens (Ramdohr 1808), Michigan (Ferguson 1957)
C. salinus (Brady 1862), Texas (Tressler 1954)
Genus *Ilyocypris* Brady and Norman
I. biplicata (Koch 1838), Texas (Tressler 1954)
Genus *Ilyodromus* Sars 1894
I. pectinatus Sharpe 1909, Ontario (Bigelow 1923); South Carolina (Ferguson 1958)
Genus *Physocypria* Vávra 1897
P. pustulosa (Sharpe 1897), Kansas (Leonard and Ponder 1949); Michigan (Cole 1953), and (Ferguson 1957); Georgia (Ferguson 1952a); South Carolina (Ferguson 1952b)
Genus *Potamocypris* Brady 1870
P. smaragdina (Vávra 1891), South Carolina (Ferguson 1952b); Texas (Tressler 1954)

Family Cytheridae
Genus *Entocythere* Marshall 1903
E. humesi Hoff 1944, North Carolina (Hobbs 1955); West Virginia (Hobbs 1955)
Genus *Limnocythere* Brady 1867
L. reticulata Sharpe 1897, Saskatchewan (Huntsman 1922), and (Moore 1953).

LITERATURE CITED

Alm, Gunnar
1914. Beitrage zur kenntnis der nördlichen und arktischen Ostracodenfauna. Arkiv. für Zoologi. Stockholm. 9:1-20.

Bigelow, N. K.
1923. The plankton of Lake Nipigon and environs. Univ. Toronto Studies, Biol. Ser., No. 22:39-66.

Blake, Charles H.
1931. Two freshwater Ostracoda from North America. Mus. Comp. Zool., Harvard College, 72:279-292.

Cole, Gerald A.
1949. A new cytherid ostracod from Minnesota. Trans. Amer. Micro. Soc., 68:350-354.

———.
1953. Notes on the vertical distribution of organisms in the profundal sediments of Douglas Lake, Michigan. Amer. Midl. Nat., 49:252-256.

Ferguson, Edward Jr.
1952a. An additional locality record of the ostracod, *Physocypria pustulosa* (Sharpe 1897). Turtox News, 30:30-31.

———.
1952b. A preliminary report on the freshwater ostracods of Orangeburg County, South Carolina. Trans. Amer. Micro. Soc., 71: 272-276.

———.
1953. A new cyprid ostracod from Maryland. Jour. Wash. Acad. Sci., 43:194-197.

———.
1954. A new ostracod of the genus *Cypricercus from South Carolina.* Trans. Amer. Micro. Soc., 73:189-192.

———.
1957. Ostracoda (Crustacea) from the northern lower peninsula of Michigan. Trans. Amer. Micro. Soc., 76:212-218.

———.
1958. Freshwater ostracods from South Carolina. Amer. Midl. Nat., 59:111-119.

Hobbs, Horton H.
1955. Ostracods of the genus *Entocythere* from the New River system in North Carolina, Virginia, and West Virginia. Trans. Amer. Micro. Soc., 74:325-333.

Hoff, C. Clayton
1942. Ostracods of Illinois, their biology and taxonomy. Ill. Biol. Monogr. 19:1-192.

Huntsman, A. G.
1922. The Quill Lakes of Saskatchewan and their fishery possibilities. Contrib. Canad. Biol., New Ser., 1:125-141. Toronto.

Johansen, Frits.
1926. List of literature recording recent freshwater Ostracoda from Canada and Alaska. Included in Sars' *Freshwater Ostracoda from Canada and Alaska.* Report Canad. Arctic Exped. 1913-1918, 7, Part I:1-23.

Kenk, Roman
1949. The animal life of temporary and permanent ponds in southern Michigan. Misc. Publ. Mus. Zool., Univ. of Mich. No. 71.

Klugh, A. B.

1921. Notes of Canadian Entomostraca. Canad. Field Nat., 35:72-73. Ottawa.

———.

1923. A new *Cyclocypris* from eastern Canada. Trans. Royal Canad. Inst., 14:337-342.

Kozloff, Eugene N. and Donald C. Whitman.

1954. *Entocythere occidentalis* sp. nov., a cytherid ostracod commensal on western species of *Pacifastacus*. Amer. Midl. Nat., 52:159-163.

Kozloff, Eugene N.

1955. Two new species of Entocythere (Ostracoda: Cytheridae). commensal on *Pacifastacus cambelli* (Girard). Amer. Midl. Nat., 53:155-161.

Leonard, A. Byron and Luke H. Ponder

1949. Crustacea in eastern Kansas. Trans. Kansas Acad. Sci., 52: 168-204.

Moore, George M.

1939. A limnological investigation of the microscopic benthic fauna of Douglas Lake, Michigan. Ecol. Monog., 9:537-582.

Moore, J. E.

1952. The Entomostraca of southern Saskatchewan. Canad. Jour. Zool., 30:410-450.

Sars, G. Ossian

1915. Entomostraca of Georgian Bay. Contrib. Canad. Biol. for 1911-1914: 221-222.

———.

1926. Freshwater Ostracoda from Canada and Alaska. Report Canadian Arctic Exped. 1913-1918, 7—part I:1-23.

Tressler, Willis L.

1947. A check list of the known species of North American freshwater Ostracoda. Amer. Midl. Nat., 38:698-707.

———.

1950. A synopsis of the ostracod genus *Cypricerus* with a description of one new species from Wyoming. Jour. Wash. Acad Sci., 40: 291-295.

———.

1954. Fresh-water Ostracoda from Texas and Mexico. Jour. Wash. Acad. Sci., 44:138-149.

INDEX

Volume 71

New names are printed in **heavy** type

A

acadiana, Cinara 8
actiniae, Heteromysis 128
aedon **effutitus**, Troglodytes **2**, 3
aedon atopus, Troglodytes 2, 3, 4
aedon inquietus, Troglodytes 3, 4
Aëronautes montivagus tatei 120
Aëronautes noctivagus 120
affinis **kuntzi**, Apus **161**, 162
affinis subfurcatus, Apus 161
agarista, Chinaia 72, **74**
Agrothrips 143-148
  arenicola 144, 145, 146, 147
  dimidiatus 144, 145, 146
  omani 143, 144, 145, 146
  pallidus 144, 145, 146, 147
  priesneri 143, 144, 147
  tantillus 145, **146**, 147, 148
  tenebricosus 144, 147
alaskaensis, Attheyella **44**
alaskana, Mesochra **47**
albescens, Pardaliparus 101
albescens, Parus elegans 100, 101, 102, 103
albicaulis, Pinus 156
albigularis albigularis, Laterallus 1
  caniceps, Laterallus 2
  cerdaleus, Laterallus **1**, 2
  Corethrura 1
  Laterallus 2
albipes, Aphis 43
alienatus, Calicurgus hyalinatus 21
allex, Baiomys taylori 18, 19
  Peromyscus 17-19
    Baiomys 17
Alpheus armatus 128
amabilis, Parus 96
ambiguus, Crossocerus 26
    Blepharipus 26
americana, Attheyella 49-52
  Brehmiella dentata 50
    northumbrica 50
  dentata 50
  Mrázekiella 50
    northumbrica 50
americanus, Canthocamptus northumbrica 49, 50
  Stigmus 24
Ampelocera crenulata 153
  cubensis 153
  pubescens **153**, 154
Amplaria 179, 180
  eutypa 180
  nazinta 180
Anabatis flammulatus 123
analis, Andrena 23
analogous, Baiomys taylori 17, 18, 19
andicolens, Pselliodes 60
Andrena analis 23
Andropogon 147
angolensis, Indicator 65, 66
    minor 65, 66
angulata, Scolopendra **58**
annulata, Bartholomea 128
annulatus, Passaloecus 24
antica, Striaria 180
antisensis, Cervus 14
apella apella, Cebus 54
apella, Cebus apella 54
Apella, Simia 54
Aphis 25
  albipes 43
  symphoricarpi 43
Aphthargelia **43**
apini, Cinara 89
appelator, Indicator 66
Apus affinis **kuntzi** **161**, 162
    subfurcatus 161
aracari, Pteroglossus 123
arenicola, Agrothrips 144, 145, 146, 147
arenicola, Karnyothrips 145
argus, Sphaerodactylus 27
armatus, Alpheus 128
Artibeus aztecus 163, 164, 165
  cinereus 163, 164, 165
    phaeotis 164, 166
  jamaicensis 165
  lituratus 165
  nanus 163, 164
  phaeotis 163, 164, 165
  rosenbergi 165
  toltecus 164, 165, 166
    toltecus 163
  turpis 163, 164
    nanus 164
    turpis 164, 165, 166
assimilis, Canthocamptus 43
Asturina schistacea 119
Ateles paniscus paniscus 54
ater, Parus ("Periparus") 96
atopus, Troglodytes aedon 2, 3, 4
  musculus 2, 4
atra, Cinara 79, 89
atratus parenosas, Diodontus (Diodontus) 22
atripes, Cinara 6. **7**, 8, 10
Attheyella **alaskaensis** **44**
  americana 49-52
  Brehmiella 51
    dentata americana 50
    northumbrica americana 50
  dentata 49, 50, 51
    americana 50
  dogieli 49, 50, 51
  idahoensis 44, 45
  Mrazekiella americana 50
  northumbrica americana 50
  northumbricoides 50
  willeyi 50
auriculatus, Eleutherodactylus 37, 38, 41
austrus, Desmonus 174, 176, 177, **178**
azarae, Ozelaphus 15
aztecus, Artibeus 163, 164, 165

B

backi, Trypoxylon (Trypoxylon) 21

Baiomys allex, Peromyscus 17
  musculus musculus 17
  taylori allex 18, 19
    analogous 17, 18, 19
    paulus 17, 18, 19
    taylori 17
baliolus, Ortalis ruficauda 120
Ballophilidae 59
banksiana, Cinara 76, 82
banksiana, Pinus 83
Bartholomea annulata 128
bartschi, Deiroptyx 42
basirufa, Mimesa (Mimesa) 22
bella, Chinaia 69, 74
Berry, F. H. iv
Bezoarticus 14, 15
bezoarticus, Blastocerus 14
  Cervus 14, 15
  Ozotoceros 13
bicinctus, Hypnelus ruficollis 121, 122, 123
bifurcata, Chinaia **71**, 72, 73, 74
biplicata, Ilyocypris 199
Blake, S. F. iv
blanoides, Cadea 42
Blastocera 13, 14, 15
Blastoceros 13, 14, 15
  campestris 15
Blastocerus 13, 14, 15
  bezoarticus 14
  campestris 14
  dichotomus 15
  paludosus 13, 14, 15
Blastoros 15
Blepharipus ambiguus, Crossocerus 26
bongaoensis, Parus elegans **105**
Brady, M. K. iv
braggii, Cinara 64
Brehmiella 49-52
  Attheyella 51
  dentata americana, Attheyella 50
  northumbrica americana, Attheyella 50
brevis, Coleonyx 149, 151
brevispinosa, Cinara 75, 76, 77, 79
bricenoi, Thripadectes flammulatus 123
Bryocamptus minutus 45
  tarnogradskyi 46
  umiatensis 45
  washingtonensis 45

C

Cadea blanoides 42
caesioannulatus, Spirostrephon **113**
calcarata, Rhoda 57
Caldwell, D. K. iv
Calicurgus hyalinatus alienatus 21
californica, Striaria 180, 181
californicus, Ethmostigmus **185**, 186
Calopsectra 26
cambelli, Pacifastacus 201
campestris, Blastoceros 15
  Blastocerus 14
  Cervus 14
  Ozotoceros 13, 15
Candona crogmaniani 198
  decora 198
  elliptica 198
  fabaeformis 198
  hiplotensia 197
  hoffi 197
  indigena 198
  intermedia 198
  michoa 197
  orageburgensis 197
  patzcuaro 197
  simpsoni 198
Candonocypris deeveyi 197
caniceps, Lateralius albigularis 2
Canthocamptus 51
  assimilis 43
  northumbricus 49
    americanus 49, 50
  robertcokeri **43**, 48
  sinuus 43
  staphylinoides 43
caprella, Chinaia **71**, 72, 73, 74
carmela, Striaria 180
carolinensis, Cyprinotus 198
castanea, Cyclocypris 197, 199
castaneus, Cebus 56
caudata, Entocythere 198
Causey, Nell B. 173-178, 179-184
causeyae, Striaria 180, 181
cavernarum Pseudotremia 113, 114, 115, 116, 117
ceanothae, Xysma 21, 25
Cebus 55, 56
  apella apella 54
  casteneus 56
  nigrivittatus 54, 55, 56
  olivaceus 56
Cercopithecus 53
cerdaleus, Laterallus albigularis **1**, 2
Cervus 13, 14, 15
  antisensis 14
  bezoarticus 14, 15
  campestris 14
  dichotomus 13, 14
  hemionus 14
  macrotis 14
  paludosus 13, 14
Chace, Fenner A., Jr. 125-132
Chamberlin, Ralph V. 57-60, 185,186
cheboyganensis, Cypricercus 197
Chilopods 57-60, 185-186
Chinaia 69-74
  agarista 72, **74**
  bella 69, 74
  bifurcata **71**, 72, 73, 74
  caprella **71**, 72, 73, 74
  citrena 74
  cumara 72, **73**, 74
  lepida 69, 72, **73**, 74
  ornata 74
  permista 69, **71**, 72, 73, 74
  punctata 74
  ribescens 74
  smithii 74
  undata 74
Chlamydotheca texasiensis 198
Chrysothrix nigrivittatus 56
  [=Saimiri] nigirittatus 55
Cinara 62, 63, 64, 79, 87, 89, 157, 159, 171, 187, 189, 191
  acadiana 8
  apini 89
  atra 79, 89
  atripes 6, **7**, 8, 10
  banksiana 76, 82
  braggii 64
  brevispinosa 75, 76, 77, 79
  contortae **75**, 76, 77
  fornacula 62
  glabra 189
  harmonia **192**-195
  hirsuta 86, 89
  hirticula **87**, 88, 89, 159

jucunda **171**-172
kocheta **81**, 82, 83
kuchea **85**, 86
moketa 89, 159
nepticula **63**, 64
nigra 82, 83
pallidipes 6, **8**, 9, 172
parvicornis **76**, 77, 78, 79
pinivora 191, 194, 195
pseudoschwarzii 159
rigidae **5**, 6, 7
saccharinipini **157**-159
sitchensis **61**, 62
soplada 6, 8, 10
strobi 7
tunicula **187**-189
villosa 62
cinerea orolestes, Neotoma 109
cinerascens, Rynchops nigra 120
cinereus, Artibeus 163, 164, 165
phaeotis, Artibeus 164, 166
cinerus, Sphaerodactylus 27
citrina, Chinaia 74
Clarke, J. F. Gates iv
claremontiana, Essigella 156
Cleidogona 116
cobanensis, Myotis 170
velifer 167, 169, 170
Coelioxys 23
Coleonyx 149-152
brevis 149, 151
Coleonyx elegans 149, 150, 151
fasciatus 151
mitratus 149, 151, 152
reticulatus 150, **151**
variegatus 151
coloratus, Hypnelus ruficollis 121, 122
columbia, Striaria 180
columbiana, Striaria 179, 182
conradi, Dentalium 91, 92
contorta, Piuns 75, 76, 79
contortae, Cinara **75**, 76, 77
coonoranus, Ethmosligmus 186
Corethrura albigularis 1
Corynopus rufigaster, Euplilis 26
crenulata, Ampelocera 153
Cricotopus 26
crogmaniana, Candona 198
croizati, Minla cyanouroptera **162**
Crossocerus ambiguus 26
Crossocerus Blepharipus ambigus 26
Cryptopida 58
Cryptops **goiasus** **58**
heathi 58
cubensis, Ampelocera 153
culiciformis, Procladius 26
cumara, Chinaia 72, **73**, 74
curta, Desmoniella 173, 174
cyanouroptera **croizati**, Minla **162**
wingatei, Minla 162
Cyclocypris 201
castanea 197
forbesi 199
laevis 199
serena 199
sharpei 199
Cynomys ludovicianus ludovicianus 109
Cypria exsculpta 198, 199
inequivalva 198
lacustris 198
obesa 198
ophthalmica 199
turneri 199
Cypricerus 197, 199, 200, 201
cheboyganensis 197
reticulatus 199
serratus 197
tincta 199
tressleri 197
tuberculatus 199
Cypriconcha macra 198
Cypridopsis musquizensis 198
phantomensis 198
potamis 198
toyensis 198
vidua 199
Cyprinotus carolinensis 198
dentatus 199
incongruens 199
salinus 199
sulphureus 197
Cypris grandis 198
Cypselus montivagus 120

D

daphinoides, Entocythere 198
Davis, William B. 163-166
Davis, William B., and James R. Dixon 149-152
decolor, Hypnelus ruficollis 121, 122
decora, Candona 198
decoratus decoratus, Sphaerodactylus 27, 28, 33, 35
drapetiscus, Sphaerodactylus **29**, 30, 32, 33, 34, 35
gibbus, Sphaerodactylus 28, 29, 32, 33, 35
Sphaerodactylus 27, 28, 29, 32, 33, 34
Sphaerodactylus decoratus 27, 28, 33, 35
torrei, Sphaerodactylus 27, 28, 29, 30, 32, 35
deeveyi, Candonocypris 197
Deignan, H. G. 161-162
Deiroptyx bartschi 42
vermiculatus 42
Dentalium 91
conradi 91, 92
petricola 91, 93
petricolum 93
pseudonyma 91, 92
rectius 93
(Rhabdus) petricola 93
substriatum 91, 92, **93**
substriatum (Teredo) 92, 93
dentata americana, Attheyella 50
(Brehmiella) 50
Attheyella 49, 50, 51
dentatus, Cyprinotus 199
Desmoniella 173, 174
curta 173, 174
Desmonius **inordinatus** **176**, 177, 178
Desmonus 173, 174, 178
austrus 176, 177, **178**
earlei 173, 174, 177
earlei earlei 174, 175, 176
earlei **mancus** **175**
pudicus 173, 174, 175, 176, 177, 178
Diaptomus floridanus 51
dichotoma, Dorcelaphus 15
dichotomus, Blastocerus 15
Cervus 13, 14
dicotomus, Edocerus 15
diffidens, Husseyella 135
diffidentis, Microvelia 135
dimidiatus, Agrothrips 144, 145, 146
Eleutherodactylus 37
Watsoniella 145

(Diodontus) atratus parenosas, Diodontus 22
Dixon, J. R. iv
Dixon, James R., & Wm. B. Davis 149-152
dogieli, Atheyella 49, 50, 51
Dorcelaphus 14, 15
dichotoma 15
Drake, Carl J. 133-142
drapetiscus, Sphaerodactylus 32, 33, 34
drapetiscus, Sphaerodactylus decoratus **29**, 30, 32, 33, 34, 35
Drepanaphis 22, 24
Duidia tatei 120
Duvall, Allen J. iv

E

earlei, Desmonus 173, 174, 177
Desmonus earlei 174, 175, 176
earlei, Desmonus 174, 175, 176
mancus, Desmonus 174, **175**
edithae, Pardaliparus 97
edithae, Parus, elegans 97
Edocerus 13, 15
dicotomus 15
effutitus, Troglodytes aedon **2**, 3
eileenae, Eleutherodactylus 37
Elaphus 13, 14, 15
Elbel, R. E. iv
eldora, Striaria 180
elegans albescens, Parus 100, 101, 102, 103
bongaoensis, Parus **105**
Coleonyx 149, 150, 151
edithae, Parus 97
elegans, Parus 97, 98, 99, 100, 101, 102, 103, 104
gilliardi, Parus **98**, 99, 100, 104
guimarasensis, Pardaliparus 101, 102
mindanensis, Pardaliparus 104
mindanensis, Parus 96, 104, 105
montigenus, Paradaliparus 97
Parus 97, 98, 99, 100
panayensis, Pardaliparus 99, 100, 101, 102
Pardaliparus 105, 106
Parus 95-106
elegans 97-104
suluensis, Pardaliparus 104
Parus 104, 105
visayansus, Paıdaliparus 102, 103
Parus 102, 103
Eleutherodactylus 37-42
auriculatus 37, 41
dimidiatus 37
eileenae 37
gehrmanni 37, 42
greyi 40
ricordi 37, 40
sonans 37
symingtoni 37, 40, 41, 42
tylus 40
varians 37
varleyi 37
zeus **38**, 39, 40, 41, 42
elliptica, Candona 198
Emerson, K. C. iv
Emerson, William K. 91-94
Empoasca, pergandei 26
Entocythere 200
caudata 198
daphinoides 198
ericksoni 198
humesi 199
occidentalis 201
runki 198
Entomostraca 201
Ephuta 24
scrupea 23
ericksoni, Entocythere 198
esculpta, Cypria 198, 199
Espischura nevadensis 48
Essigella claremontiana 156
oregonensis **155**, 156
pergandei 156
Ethmostigmus **californicus** **185**, 186
coonoranus 186
waiainus 186
Euplilis (Corynopus) rufigaster 26
Eurycotis 41
eutypa, Amplaria 180
evidis, Rhagovelia 140
exilis 65, 66, 67
meliphilus, Melignothes 65
pachyrhynchus, Indicator 65

F

famaeformis, Candona 198
fallax, Leucippus 121
richmondi, Leucippus 121
fasciatus, Coleonyx 151
feicki, Tropidophis 42
Feinstein, Bernard iv, 11-12
Ferguson, Edward, Jr. iv, 197-202
flammulatus, Anabates 123
bricenoi, Thripadectes 123
flammulatus, Thripadectes 123
flavicaudus, Sphaeradactylus 28
floridanus, Diaptomus 51
forbesi, Cyctocypris 199
formicum, Tennesseelum 21
formosus, Pteroglossus 123
fornacula, Cinara 62
fraternus, Stigmus 24
Friedmann, Herbert iv, 65-68
Furcifer 14

G

Gastrimargus olivaceus 56
gehrmanni, Eleutherodactylus 37, 42
gibbus, Sphaerodactylus 27, 28, 29, 32, 33, 34
decoratus 28, 29, 32, 33, 35
gilliardi, Parus elegans **98**, 99, 100, 104
glabra, Cinara 189
glauca, Picea 8, 10, 172
golasus, Cryptops **58**
grandicornis, Paralinus 128
grandis, Cypris 198
granulosa, Striaria 180, 181
greyi, Eletherodactylus 40
grisia, Leucopora 23
guanerus, Koinethmus **59**
guariba, Simia 54
guimarasensis, Pardaliparus elegans 101, 102

H

(Hadothrips) omani, Haplothrips 146
(Hadothrips) tenebricosus, Haplothrips 147
halophila, Husseyella **133**, 134, 135
halovelia, Husseyella 136
hambletoni, Rhagovelia 140, 141
Handley, C. O., Jr. iv

- Haplothrips 144
  - (Hadothrips) omani 146
    - tenebricosus 147
- Hapanella 54
- **hormonia**, Cinara **192**-195
- heathi, Cryptops 58
- hemionus, Cervus 14
- henkei, Nectarinia sperata 98, 99
- Herpetocypris pettersoni 198
- Hershkovitz, Philip 13-16, 53-56
- Hesperomys leucopus nebrascensis 109
  - sonoriensis 107
  - sonoriensis nebrascensis 107, 109
- Heteromysis actiniae 128
- Hilaria rigida 145
- hiplotensia, Candona 197
- hirsuta, Cinara 86, 89
- **hirticula**, Cinara **87**, 88, 89, 159
- hoffi, Candona 197
- Hoffman, Richard L. 113-118
- Hottes, F. C. 5-10, 43-44, 61-62, 63-64, 75-80, 81-84, 85-86, 87-90, 155-156, 157-160, 171-172, 187-190, 191-196
- humesi, Entocythere 199
- Huntermannia 43-48
  - jadensis 47, 48
  - **lacustris** **47**, 48
- Husseyella 133
  - diffidens 135
  - **halophila** **133**, 134, 135
  - halovelia 136
- hyalinatus alienatus, Calicurgus 21
- Hypnelus ruficollis bicinctus 121, 122, 123
  - coloratus 121, 122
  - decolor 121, 122
  - ruficollis 121, 122
  - stoicus 121, 122, 123
  - **striaticollis** **121**, 122

I

- idahoensis, Attheyella 44, 45
- Idiocerus 22
- Ilyocypris biplicata 199
- Ilyodromus pectinatus 199
- imberbis, Striaria 183
  - Vaferaria 183
- incongruens, Cyprinotus 199
- indianae, Pseudotremia 114, 116
- Indicator 65
  - angolensis 65, 66
  - appelator 66
  - meliphilus 65, 66, 67
    - meliphilus 66
  - minor 67
    - angolensis 65, 66
  - narokensis 66
  - pumilio 65, 67
- indigena, Candona 198
- inequivalva, Cypria **198**
- **inordinatus**, Desmonius **176**, 177, 178
- inquietus, Troglodytes aedon 3, 4
- intermedia, Candona 198
- **irvingi**, Leucosticte tephrocotis **11**, 12
- **isolata**, Rhoda **57**
- itasca, **Limnocythere** 198

J

- jadensis, Huntemannia 47, 48
- jamaicensis, Artibeus 165
- janeira, Rhagovelia 140
- Johnson, David H.
- Jones, J. Knox, Jr. 107-112
- **jucunda**, Cinara **171**-172

K

- Karnythrips 144
  - arenicola 145
- klagesi, Thripadectes virgaticeps 123, 124
- **kocheta**, Cinara **81**, 82, 83
- **Koinethmus guanerus** **59**
- Kramer, James P. iv, 69-74
- Krombein, Karl V. iv, 21-26
- Kruse, Paul J.
- **kuchea**, Cinara **85**, 86
- **Kuntzi**, Apus affinis **161**-162

L

- lacustris Cypria 198
- **lacustris**, Huntemannia **47**, 48
- laevis, Cyctocypris 199
- lambertiana, Pinus 89, 159
- Lange, K. I. iv
- Laterallus albigularis 2
  - albigularis 1
  - caniceps 2
  - **cerdaleus** **1**, 2
  - melanophaius 2
- Lechniella pinivora 191
- Leontideus 54
- Leontocebus 53, 54
- Leontopithecus 53
- **lepida**, Chanaia 69, 72, **73**, 74
- Leucippus fallax 121
  - richmondi 121
- Leucophora 24
  - sociata 23
- Leucopora grisia 23
- Leucopternis schistacea 119
- leucopus nebrascensis, Hesperomys 109
  - sonoriensis, Hesperomys 107
- Leucosticte tephrocotis 11, 12
  - **irvingi** **11**, 12
  - littoralis 11, 12
  - tephrocotis 11, 12
- Limnocythere itasca 198
  - reticulata 199
- lituratus, Artibeus 165
- littoralis, Leucosticte tephrocotis 11, 12
- ludovicianus, Cynomys ludovicianus 109
  - ludovicianus, Cynomys 109
- luteus, Peromyscus 107, 110
  - maniculatus 109, 110

M

- macotis, Cervus 14
- macra, Cyprioconcha 198
- Macrosiphum 24
- **mancus**, Desmonus earlei **175**
- mandibularis, Passaloecus 24, 25
- maniculatus osgoodi, Peromyscus 107, 110
  - luteus, Peromyscus 109, 110
  - nebrascensis, Peromyscus 107-112
  - Peromyscus 107, 109, 110
- Manville, R. H. iv
- Marikina 54
  - (Tamarin) midas 53
- Marsh, R. J. iv
- Mead, G. W. iv
- melanophaius, Laterallus 2
- Melignothes exilis meliphilus 65
- meliphilus, Indicator 65, 66, 67
  - meliphilus 66
  - Melignothes exilis 65
  - meliphilus, Indicator 66

Mesochra **alaskana** **47**
  rapiens 47, 48
michoa, Candona 197
Microvelia diffidentis 135
Midas 53
midas, Marikina (Tamarin) 53
  midas, Saguinus 53
  Saguinus midas 53
Midas Simia 53
(Mimesa) basirufa, Mimesa 22
Mimesa (Mimesa) basirufa 22
mindanensis, Pardaliparus elegans 104
  Parus elegans 96, 104, 105
Minla cyonouroptera **croizati** **162**
  wingatei 162
minor angolensis, Indicator 65, 66
  Indicator 67
minutus, Bryocamptus 45
mitratus, Coleonyx 149, 151, 152
modestus, Tendipes 26
moketa, Cinara 89, 159
Monellia 24
monticola, Pinus 86
montigenus, Pardaliparus elegans 97
  Parus elegans 97, 98, 99, 100
montivagus, Cypelus 120
  tatei, Aëronautes 120
Morton, C. V. 153-154
Mrázekiella 51
(Mrázekiella) americana, Attheyella 50
Muesebeck, C. F. W. iv
musculus atopus, Troglodytes 2, 4
  Baiomys musculus 17
  muscullus, Baiomys 17
musquizensis, Cypridopsis 198
Myotis cobanensis 170
  velifer 167, 169, 170
  cobanensis 167, 169, 170
  velifer 167, 168, 169, 170
Mystax 54

N

nana, Striaria 180
nanus, Artibeus 163
  turpis 164, 166
narokensis, Indicator 66
nazinta, Amplaria 180
  Striaria 180
nebrascensis, Hesperomys leucopus 109
  sonoriensis 107, 109
  Peromyscus 111
  maniculatus 107-112
  texanus 110
Nectarinia sperata 98, 99
  henkei 98, 99
  sperata 98, 99
  thereseae 98, 99
neomodestus, Tendipes 26
Neoscona 21
Neotoma cinerea orolestes 109
Neovelia traili 133
nepticula, Cinera **63**, 64
nervosus, Tendipes 26
nevadensis, Espieschura 48
Newportia **sargenti** **58**
nigirittatus, Chryothrix (=Saimiri) 55
nigra, Cinara 82, 83
  cinerascens, Rynchops 120
  nigra, Rynchops 120
  Rynchops nigra 120
nigrivittatus, Cebus 54, 55, 56
  Chrysothrix 56
nigropunctatus, Sphaerodactylus 27, 36
northumbrica americana, Attheyella 50
  (Brehmiella) 50
northumbricus americanus, Canthocamptus 49, 50
  Canthocamptus 49
northumbricoides, Attheyella 50
notatus, Sphaerodactylus 27
notivagus, Aëronautes 120

O

obesa, Cypria 198
occidentalis, Entocythere 198, 201
Odocoileus 14
Oedipomidas 54
Oedipus 54
olivaceus, Cebus 56
  Gastrimargus 56
oliveri, Sphaerodactylus 27
omani, Agrothrips 143, 144, 145, 146
  Haplothrips (Hadothrips) 146
Oniscomorpha 173
Onomeris 173
ophthalmica, Cypria 199
orange burgensis, Candona 197
oregonensis, Essigella **155**, 156
ornata, Chinaia 74
orolestes, Neotoma cinerea 109
Ortalis ruficauda 119, 120
  baliolus 120
  ruficrissa 119
osgoodi, Peromyscus maniculatus 107, 110
Ostracoda 197-202
Owens, Howard B. iv
Ozelaphus 15
  azarae 15
Ozotoceras 15
Ozotoceros 13, 14, 15
  bezoarticus 13
  campestris 13, 15

P

pachryhynchus, exilis, Indicator 65
Pacifastacus cambelli 201
Packard, Robert L. 17-20
pallidipes, Cinara 6, **8**, 9, 172
pallidus, Agrothrips 144, 145, 146, 147
  Zyathrips 146
paludosus, Blastocerus 13, 14, 15
  Cervus 13, 14
panayensis, Pardaliparus elegans 99, 100, 101, 102
paniscus, Atelus paniscus 54
  paniscus, Ateles 54
Paniscus, Simia 54
Paracamptus **reggiae** **46**
  schmeili 47
Paradiso, John L. iv
Paralinus grandicornis 128
Pardaliparus 96
  albescens 101
  edithae 97
Pardaliparus elegans 105, 106
  guimarasensis 101, 102
  mindanensis 104
  montigenus 97
  panayensis 99, 100, 101, 102

    suluensis 104
    visayanus 102, 103
parenosas, Diodontus (Diodontus) atratus 22
Parkes, Kenneth C. 95-106
Parus 95-106
  amabilis 96
  elegans 95-106
    albescens 100, 101, 102, 103
    bongaoensis **105**
    edithae 97
    elegans 97-104
    gilliardi **98**, 99, 100, 104
    mindanensis 96, 104, 105
    montigenus 97, 98, 99, 100
    suleuensis 104, 105
    visayanus 102, 103
  ("Periparus") ater 96
  quadrivittatus 99, 100
  venustulus 96
parvicornis, Cinara **76**-79
Passaloecus annulatus 24
  mandibularis 24, 25
  relativus 25
pattersoni, Herpetocypris 198
patzcuaro, Candona 197
paulana, Rhagovelia 138
paulus, Baiomys taylori 17-19
pectinatus, Ilyodromus 199
pedersoni, Periclimenes 128
pedersoni, Periclimenes (Periclimenes) **125**, 129, 130
pergandei, Empoasca 26
  Essigella 156
Periclimenes 125-130
  pedersoni 128
(Periclimenes) **pedersoni**, Periclimenes **125**, 129, 130
  yucatanicus 128
("Periparus") ater, Parus 96
permista, Chinaia 69, **71**, 72, 73, 74
Peromyscus allex 17-19
  [=Baiomys] allex 17
  luteus 107, 110
  maniculatus 107, 109, 110
    luteus 109, 110
    nebrascensis 107-112
    osgoodi 107, 110
  nebracensis 111
  texanus nebracensis 110
petricola, Dentalium 91, 93
    (Rhabdus) 93
petricolum, Dentalium 93
phaeotis, Artibeus 163-165
phaeotis, Artibeus cinereus 164, 166
phantomensis, Cypridopsis 198
Phelps, William H., & William H. Phelps, Jr. 119-124
Phrynus 41
Physocypria pustulosa 199, 200
Picea glauca 8, 10, 172
  rubens 63, 64
  sitchensis 62
pinivora, Cinara 191, 194, 195
  Lechniella 191
Pinus 192
  albicaulis 156
  banksiana 83
  contorta 75, 76, 79
  lambertiana 89, 159
  monticola 86
  resinosa 195
  rigida 7
  virginiana 189

potamis, Cypridopsis 198
Potamocypris smaragdina 199
priesneri, Agrothrips 143, 144, 147
Primates 53-56
Pselliodes andicolens 60
Prociphilus tesselatus 22
Procladius culiciformis 26
  subglaber **59**, 60
Pselliodidae 59
pseudonyma, Dentalium 91, 92
pseudoschwarzii, Cinara 159
Pseudotremia 113-118
Pseudotremia cavernarum 113-117
  indianae 114, 116
  sublevis 114
  vudii 113
Pteroglossus aracari 123
  formosus 123
  wiedi 123
pubescens, Ampelocera **153**, 154
pudicus, Desmonus 173-178
  Spheriodesmus 174, 175, 177
pumilio, Indicator 65, 67
punctata, Chinaia 74
pustulosa, Physocypria 199, 200

Q

quadrivittatus, Parus 99, 100

R

rapiens, Mesochra 47, 48
rectius, Dentalium 93
reggiae, Paracamptus **46**
relativus, Passaloecus 25
resinosa, Pinus 195
reticulata, Limnocythere 199
reticulatus, Coleonyx 150, **151**
  Cyprecercus 199
(Rhabdus) petricola, Dentalium 93
Rhagovelia 133, 141
  evidis 140
  hambletoni 140, 141
  janeira 140
  paulana 138
  sabrina **138**, 139
  stibea **138**, 139, 140
  traili 133, 134
  velocis 141
  yucuivana 131, **141**
Rhoda calcarata 57
  isolata **57**
ribescens, Chinaia 74
richmondi, Leucippus fallax 121
ricordi, Eleutherodactylus **37**, 40
rigida, Hilaria 145
  Pinus 7
rigidae, Cinara **5**, 6, 7
robertcokeri, Canthocamptus **43**, 48
rosenbergi, Artibeus 165
rubens, Picea 63, 64
ruficauda baliolus, Ortalis 120
ruficauda, Ortalis 119, 120
  ruficrissa, Ortalis 119
ruficollis bicinctus, Hypnelus 121, 122, 123
  coloratus, 121, 122
  decolor, 121, 122
  Hypnelus ruficollis 121, 122
  ruficollis, Hypnelus 121, 122
  stoicus, 121, 122, 123
  striaticollis, **121**, 122
ruficrissa, Ortalis 119
    ruficauda 119

rufigaster, Euplilis (Corynopus) 26

runki, Entocythere 198
Russell, L. M. iv
Rynchops nigra cinerascens 120
  nigra 120

S

sabrina, Rhagovelia **138**, 139
saccharinipini, Cinara **157**-159
Saguinus 53
  (Saguinus) midas midas 53
  tamarin 53
  ursula 53
Saimira 55
[=Saimira] nigirittatus, Chryothrix 55
salinus, Cyprinotus 199
sargenti, Newportia **58**
scaber, Sphaerodactylus 27
Scaphopod 91-94
Schantz, V. S. iv
schistacea, Asturina 119
  Leucopternis 119
schmeili, Paracamptus 47
Schwartz, Albert 27-36, 37-42
sclateri, Thripadectes virgaticeps 124
Scolopendridae 57, 58
Scolopendra angulata 58
  viridicornis 58
scrupea, Ephuta 23
Seniocebus 54
serena, Cyctocypris 199
serratus, Cypricercus 197
seticornis, Stenorychus 128
Setzer, Henry W. iv
sharpei, Cyctocypris 199
shastae, Striaria 180, **182**
Simia Apella 54
  guariba 54
  Paniscus 54
simpsoni, Candona 198
sinuus, Canthocamptus 43
sitchensis, Cinara **61**, 62
  Picea 62
smaragdina, Potamocypris 199
smithii, Chinaia 74
sociata, Leucophora 23
Solaenogona 116
sonans, Eleutherodactylus 37
sonoriensis, Hesperomys leucopus 107
  nebrascensis, Hesperomys 107, 109
soplada, Cinara 6, 8, 10
sperata henkei, Nectarinia 98, 99
  Nectarinia 98, 99
    sperta 98, 99
  sperata, Nectarinia 98, 99
  thereseae, Nectarinia 98, 99
Sphaerodactylus 27-36
  argus 27
  cinerus 27
  decoratus 27, 28, 29, 32, 33, 34
    decoratus 27, 28, 33, 35
    drapetiscus **29**, 30, 32, 33, 34, 35
    gibbus 28, 29, 32, 33, 35
    incertae sedis 35
    torrei 27, 28, 29, 30, 32, 35
  drapetiscus 32, 33, 34
  flavicaudus 28
  gibbus 27, 28, 29, 32, 33, 34
  nigropunctatus 27, 36
  notatus 27
  oliveri 27
  scaber 27
  stejnegeri 28, 33, 34, 35
  torrei 28, 32, 33, 34
Spheriodesmus pudicus 175, 177
Spilomena 25
Spirostrephon caesioannulatus 113
Stannard, Lewis J., Jr. 143-148
staphylinoides, Canthocamptus 43
stejnegeri, Sphaerodactylus 28, 33, 34, 35
Stenorychus seticornis 128
stibea, Rhagovelia **138**, 139, 140
Stigmus americanus 24
Stigmus fraternus 24
stoicus, Hypnelus ruficollis 121, 122, 123
Striaria 179, 180, 182
  antica 180
  californica 180, 181
  carmela 180
  causeyae 180, 181
  columbia 180
  columbiana 179, 182
  eldora 180
  granulosa 180, 181
  imberbis 183
  nana 180
  nazinta 180
  shastae 180, **182**
  zygoleuca 181
striaticollis, Hypnelus ruficollis **121**, 122
strobi, Cinara 7
subfurcatus, apus affinis 161
subglaber, Pselliodes **59**, 60
sublevis, Pseudotremia 114
substriata, Teredo 91, 92, 93
substriatum, Dentalium 91, 92, 93
substriatum, Teredo 92, 93
  (Teredo), Dentalium? 92, 93
sulphureus, Cyprinotus 197
suluensis, Pardaliparus elegans 104
  Parus elegans 104, 105
sumaco, Thirpadectes virgaticeps 124
symingtoni, Eleutherodactylus 37, 40, 41, 42
symphoricarpi, Aphis 43

T

tachirensis, Thripadectes virgaticeps **123**, 124
Taeniolinum 59
Tamarin 53
(Tamarin) midas, Markina 53
tamarin, Saguinus 53
Tamarinus 54
tantillus, Agrothrips 145, **146**, 147, 148
tarnogradskyi, Bryocamptus 46
tatei, Aëronautes montivagus 120
  Duidia 120
taylori allex, Baiomys 18, 19
  analogous, Baiomys 17, 18, 19
  Baiomys 17, 18, 19
  Baiomys taylori 17
  paulus, Baiomys 17, 18, 19
  taylori, Baiomys 17
tephrocotis **irvingi**, Leucosticte **11**, 12
tephrocotis, Leucosticte **11**, 12
    tephrocotis 11, 12
  littoralis, Leucosticte 11, 12
(Teredo), Dentalium? substriatum 92, 93
Teredo substriata 91, 92, 93
  substriatium 92, 93

tesselatus, Prociphilus 22
texanus nebrascensis, Peromyscus 110
texasiensis, Chlamydotheca 198
Thargelia 43
thaumana, Rhagovelia **136**, 137, 138
therescae, Nectarinia sperata 98, 99
Therioaphis 24
Thomas, Richard iv
Thripadectes flammulatus bricenoi 123
    flammulatus 123
  virgaticeps klagesi 123, 124
    sclateri 124
    sumaco 124
    tachirensis **123**, 124
    virgaticeps 124
Thysanoptera: Phlaeothripidae 143-148
tincta, Cypricercus 199
toltecus, Artibeus 164, 165, 166
toltecus, Arbiteus toltecus 163
  toltecus, Arbiteus 163
Torre, Luis de la 167-170
torrei, Sphaerodactylus 28, 32, 33, 34
    decoratus 27, 28, 29, 30, 32, 35
toyensis, Cypridopsis 198
tressleri, Cypricercus 197
traili, Neovelia 133
  Rhagovelia 133, 134
Troglodytes aedon atopus 2, 3, 4
    effutitus **2**, 3
    inquietus 3, 4
  musculus atopus 2, 4
Tropidophis feicki 42
Trypoxylon (Trypoxylon) backi 21
tuberculatus, Cypricercus 199
tunicula, Cinara **187**-189
turneri, Cypria 199
turpis, Arbiteus 163, 164
    turpis 164, 165, 166
  nanus, Artibeus 164, 166
  turpis, Artibeus 164, 165, 166
tylus, Eleutherodactylus 40
Typhlocyba 22

U

umiatensis, Bryocamptus 45
undata, Chinaia 74
ursula, Saguinus 53

V

Vaferaria 179, **182**
  imberbis 183
varians, Eleuthorodactylus 37
variegatus, Coleonyx 151
varleyi, Eleutherodactylus 37
velifer cobanensis, Myotis 167, 169, 170
velifer, Myotis 167, 169, 170
velifer, Myotis velifer 167-170
velifer velifer Myotis 167-170
velocis, Rhagovelia 141
venustulus, Parus 96
vermiculatus, Deiroptyx 42
vidua, Cypridopsis 199
villosa, Cinara 62
virgaticeps klagesi, Thripadectes 123, 124
  sclateri, Thirpadectes 124
  sumaco, Thirpadectes 124
  tachirensis, Thirpadectes **123**, 124
  Thripadectes virgaticeps 124
virginiana, Pinus 189
  Xylocelia 22, 23
viridicornis, Scolopendra 58
visayanus, Pardaliparus elegans 102, 103
  Parus elegans 102, 103
vudii, Pseudotermia 113

W

waiainus, Ethmostigmus 186
washingtonensis, Bryocamptus **45**
Watsoniella dimidiata 145
Wetmore, Alexander 1-4
wiedi, Pteroglossus 123
willeyi, Attheyella 50
Wilson, Mildred Stratton 43-48, 49-52
wingatei, Minla cyanouroptera 162

X

Xylocelia 24
  virginiana 22, 23
Xysma ceanothae 21, 25

Y

yaculvana, Rhagovelia 137, **141**
yucatanicus, Periclimenes 128

Z

zeus, Eleutherodactylus **38**-42
Zug, George iv
Zyathrips pallidus 46
zygoleuca, Striaria 181